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COAL AGE

The World's Accepted Authority on Coal Mining

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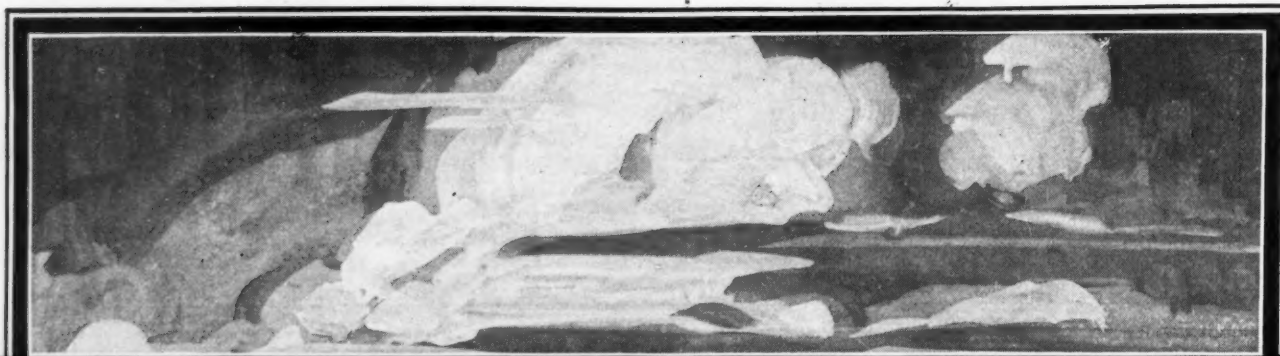


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Castlegate Practices

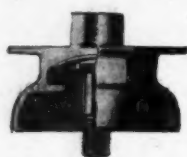
The Utah Fuel Co. always exhibited advanced ideas in its practice and took unusual precautions to protect the lives of its men. But the explosion of Castlegate No. 2 awoke the management to further inventiveness, and George J. Young, associate editor of *Coal Age*, in a recent trip to Wyoming and Utah recognized that here was a story that *Coal Age* readers would want to hear. He tells it next week. Not to divulge too much, one notable matter is the decision to draw pillars in future, because a big mine with a lot of standing pillars cannot be adequately ventilated and is liable to have gas lurking in the rooms. Then again the management decided to close off with thick brattices what rooms were standing. It will be remembered that Col. Edward O'Toole sounded just such a warning note about the dangers of leaving large open spaces in mines. If something happens the results are likely to be serious, and with such possible magazines of gas a disaster may come at any time.

Shaker-Conveyor Loader

H. F. McCullough will give next week some details regarding the shaker-conveyor loader or "duck bill." The conveyor in its dodging back and forth noses into the coal pile which mysteriously disappears and can later be found resting at the bottom of the mine car on the heading. This same method of gathering and transferring coal from the face to the car on the entry has been used by the Union Pacific Coal Co. and it does good work.

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COAL AGE

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Devoted to the Operating, Technical and Business
Problems of the Coal-Mining Industry

R. DAWSON HALL
Engineering Editor

Volume 30

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Number 9

Clinch the Nail

INSTITUTES, or get-together meetings, of the superintendents, foremen, mechanics and electricians employed by centrally-managed or associated groups of mines are recognized as an efficient means of bettering methods and reducing duplicate experimentation. One possibility of such meetings is, however, generally overlooked; that is the opportunity they afford of standardizing methods and materials.

It is true that specific conditions at a mine may, in certain cases, demand a special material, but these instances are few. Each superintendent doubtless may have his preference for a certain metal mine tie or trolley clamp, but he can readily get along with any one of the standard makes. Advantage should be taken of the meetings to determine the most popular and economical material so as to standardize on that for all mines. Quantity buying thus made possible will often save a handsome sum.

Standardization of methods, the other possibility, results in operation according to a fixed plan rather than according to an individual idea. The reports and discussions at the meetings afford an opportunity to determine the most suitable plan. Too often the discussions lead nowhere. All the evidence is submitted but no definite action taken. This defeats the very purpose of the meeting. A company meeting should be a determinative not a mere deliberative assembly.

Short-Sighted Policy

IN MANY RESPECTS and from many angles those engaged in the production of coal appear to be "set in their ways." Thus radical changes come slowly. Operators, or many of them, appear to be unwilling to try anything that is decidedly new. They hesitate to adopt or try out even those devices or methods that give every promise of success. In some instances this attitude is merely the product of mental inertia; in others it appears to result from an entirely different cause.

Salesmen attempting to vend some new product to coal-mine officials, when they suggest that the new article be installed and given a fair trial, decision as to its purchase being reserved until conclusive results have been secured, are not infrequently met with the reply: "What's the use? We have neither the men nor the facilities for obtaining comparative costs. Our business is to produce coal, not experiment with either new-fangled ideas or materials."

In justice be it said that this attitude and this condition are by no means as prevalent today as they were ten or twenty years ago. Nevertheless altogether too many coal companies are but ill-prepared to make practical experiments. Such firms must forego the benefits and advantages inherent to the adoption of new and

better equipment until their utility has been thoroughly established by more progressive coal men, and must, of necessity, lag well behind the really alert members of the industry in the adoption of up-to-date means and methods and in the financial benefits that form its logical and resultant emolument.

A Factor Overlooked

THE FUNDAMENTAL PROBLEM of the bituminous coal industry today is the distribution of its product at a price which will be fair to the consumer and which will yield a reasonable profit to the producer. There is nothing esoteric or even novel about this. On the contrary, the greatest barrier to its more general acceptance is its obviousness. In the rush for more alluring, albeit illusory, short-cuts to financial solidity, so simple a truth is always in danger of being ignored. Frequent restatement, therefore, is necessary.

Such a restatement in these columns recently has been seized upon by the *United Mine Workers' Journal* with all the zeal of an evangel rejoicing that another brand has been plucked from the burning. The organ of the hard-pressed followers of Mr. Lewis hails the *Coal Age* exposition as happy evidence that another convert has been won to the cause. Occasions for jubilation in the union camp have become so rare that it would be churlish indeed to deny the leaders of the United Mine Workers whatever pleasure they can derive from such a repetition of the obvious.

There are, however, certain implications in the union's advocacy of this principle which should not be permitted to go unchallenged. The union has preached this doctrine to its members as its answer to the attacks which have been made upon the Jacksonville scale in its relationship to the wages currently paid in the non-union fields. Spokesmen for the officers of the United Mine Workers very cleverly have used this axiom in an attempt to shift the burden for distressed conditions in the union districts from their own shoulders to the shoulders of the union operators. They have said to the discontented in their own ranks: "Brothers, the fault is not that our wage rates are too high, but that your employers do not get enough for their coal."

The fatal defect in this argument is that it evades the question of responsibility. In emphasizing an obvious fundamental, the union backs away from a question equally obvious. Why is it that the producer of union-mined coal does not get more for his product? Mr. Lewis knows the answer just as well as the union operators. But for months he has declined to face the issue. To every plea of the union operators for relief from oppressive conditions, he has replied that he will consider no plan which threatens the integrity of the Jacksonville scale. Yet at no time has he come forward with any workable alternative suggestion for relief.

In short, in many districts the policy of the United Mine Workers has made it impossible for producers working under a union wage agreement to sell their coal at a profit. Whether or not that policy is, has been, or can be justified is not in issue here. Adherence to that policy has produced certain results, and the union cannot escape responsibility for the results of its own policies. The most outstanding result has been the wholesale closing down of mines by union operators who were convinced of the unsoundness of selling coal at a loss.

With the action of these operators there can be no quarrel. They have displayed a courage in refusing to persist further in a criminal waste of their capital assets that is deserving of praise and emulation. If the exhibition of that courage has resulted as disastrously to the members of the United Mine Workers as it has to some of the producers themselves, the quarrel over that, if there be any, lies between the officers of the union and their followers and is of the union's own making. A sound merchandising policy on the part of the producers is no shield behind which the United Mine Workers may hide from the responsibility for policies of its own creation.

Time Clocks

DESPITE THE FACT that most modern plants already have time clocks, the mining industry has installed practically none. It remains as almost the solitary exception partly because only a few of the men are paid by the hour. Yet the time clock is surely one of the fairest of means of measuring a dayman's compensation. At mines where the coal is weighed by a carefully balanced scale, surely the time should be recorded by an equally accurate measure, the time clock.

At one mine, recently, the assistant superintendent left, and it was soon found that the time of many of the men had not been recorded. In fact, about 300 hours had been overlooked. The men got their pay, but to arrange for that payment the company had to accept statements that could not be verified. Feeling that the time-keeping methods were unsatisfactory, the men were urgent for a change that would better the system. They did not like to work for a boss who was too busy or too indolent to keep the time. The answer was—the time clock. It was put in operation, and the men were well satisfied. They had a check on the company, and the company had a check on them.

The clock also saved the company money, for with such a device a timekeeper was not necessary. Timekeepers are usually intelligent and alert, but they are extremely inefficient. How can any man working at such a job unaided by a time clock hope to know just when everybody came to work and quit on any given day or night?

The timekeeper goes perhaps to plant No. 1 first, and does not get to plant No. 2 till 10 a.m. Meantime the men have gone underground and have worked some hours. How can he find the facts at such a late hour? He is bound to depend on hearsay.

He gives the workman usually the benefit of the doubt, for he has no evidence. If the workman is dishonest and speaks confidently he gets the entry he desires and may even get the previous day's record modified in his favor. But the time clock is almost un-

failing evidence. If a man would falsify that account he must get someone else to do it for him. The time-clock is fair, and the man who opposes it does so because he fears that the truth will become known.

Of course, there will always be a few who would have to travel long distances to punch the clock, men whose work does not commence at the mine mouth and who do not have to return to that point in the evening. For these men the foreman must provide some specific reckoning, but for those who work around the mine, the time clock is invaluable as guarding the interests of both operator and mine-worker.

Load Factors

WITH THE ADVENT of purchased power the coal industry is beginning to use the term "load factors," which is nothing more than the economic ratio known as the "factor of utility," a definite numerical statement of the relation between the work performed and the work of which a given unit is capable.

With purchased power we try by various means to spread our load as nearly as possible over the twenty-four hours of the day; the idea being to use efficiently the rated capacity of the unit every hour of the twenty-four.

The principles of the load factor as used in the power plant can be applied to haulage, hoisting and tippie facilities. This is best attained by the construction of side tracks and the use of surplus mine cars for storage to "take up the slack" during the day's run.

With side tracks at strategic points throughout the plant when delays in haulage occur, the surplus loads can be drawn upon to keep the hoist and tippie busy; then when the hoist or tippie is delayed the surplus empties can be drawn upon to keep the haulage going, thus preventing delays affecting the entire mine.

In this way the load, or the demand, upon haulage, hoisting and dumping facilities can be spread out over the eight hours, thus preventing peakloads upon these facilities. The side tracks and surplus mine cars act in the nature of a flywheel or a reservoir, storing up surplus at one time and giving out supply at another.

Smoke-Stick Methods

IN MINES having thick coal and wide rooms it is often difficult to find any trace of air moving. Even in crosscuts the passage of air may not deflect the flame of open lamps or turn an anemometer, and yet air may be moving. The smoke-stick in that case will give evidence of air motion and will measure it. It may be found that though the flow of air per square foot is small because spread over a cross-section of 150 sq.ft. or more the total quantity passing is, nevertheless, normal.

A usual way of testing brattices is with a lamp. Might not a smoke-making flask be devised that could be held near the brattice to reveal leaks through it, around its edge and in the strata surrounding it? After all the method of the plumber in testing chimneys is not to be despised. Small currents of air can be detected by smoke that mechanical devices are likely to overlook. A study of air currents made visible by smoke might reveal some interesting facts, aiding in ventilation in ways not hitherto thought of and suggesting modifications in ventilating plans.



United Electric Coal Companies' New Big Shovel

Four Open Pits Feed Modern Tipple

All Machines Except Locomotives Are Electrified—
Surface of Stripped Coal Swept With Air—Caterpillar
Mounting Under Big Stripper Saves Much Time

By Frank H. Kneeland

Associate Editor, *Coal Age*, New York City

OF ALL METHODS employed in mining coal, stripping is the simplest, at least in theory. In most instances also, where the bed does not lie too deep, it is the cheapest method available for recovering the coal, and this recovery closely approximates 100 per cent. Again, the mining of the coal is reduced to a simple quarrying operation conducted in the open air and in the light of day. It is thus entirely free from gas, roof falls and similar dangers. Ventilation problems also are unknown. For these and other reasons stripping is the method of working preferred wherever conditions are favorable.

Discovery of coal within the territorial boundaries of what is now the United States is usually credited to Father Hennepin, who recorded finding "cole" outcropping in the bluffs of the Illinois River near the present town of Ottawa. Today some of the finest and largest strippings in the country are located in the general locality where this Franciscan missionary

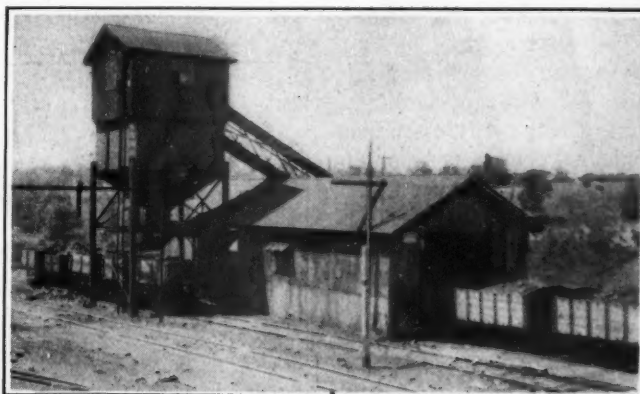
and explorer made his discovery. It is probable that from Ottawa to well below Peoria there are large areas that will be eventually worked by this method.

Inland and down the river from Peoria near the town of Cuba, the United Electric Coal Companies has one of the largest stripping operations in Illinois—and this is a state of big units. Except for the locomotives this operation is completely electrified, all of the stripping and loading shovels being driven electrically, as

is also the tipple that prepares the coal produced in all the strip pits.

The field being worked at Cuba covers approximately 1,200 acres and lies roughly in a rectangle approximately 2 miles long east and west and 1½ miles wide north and south. Of the total area, about 200 acres is barren of coal or has been already worked out. The barren region is largely confined to the valley of a branch of Big Creek and a tributary ravine.

This branch passes in the rear of the tipple and the barren area along it fur-



Bin for Tipple Refuse and Cars Being Filled
For Disposal in Spoil Bank

The cars on the right are loaded with coal which is about to be discharged. They are emptied two at a time, without uncoupling, by means of a rotary dump. At the left may be seen the slate bin which acts as a temporary storage for the refuse and pickings from the tables. Several dump cars are being loaded with this material preparatory to being hauled to one of the pits where their contents will be dumped into the spoil.



General View of Tipple and Refuse Bin

This is a steel structure covered with corrugated iron. Ample lighting is provided by means of windows and skylights. The big conveyor leading into the tipple carries coal from the dump house to the head of the shaking screens. The smaller conveyor brings pickings from the tables to the slate bin.

nishes a right of way for the shipping track as well as a site for the empty and loaded storage yards. The shipping track is about $1\frac{1}{2}$ miles in length and connects with a branch of the Chicago, Burlington & Quincy R.R. extending from Galesburg to West Havana.

Above the tipple, a storage yard capable of accommodating 120 cars has been built, and a similar yard for loads lies below it. Here a track scale for ascertaining the gross weight of loaded cars has been installed. Tare on these cars is taken from the stenciled weights upon their sides. The tipple itself is a five-track structure. It is built of structural shapes and covered with corrugated iron, galvanized and painted. It has a capacity of 5,000 tons per day, which output places it in the ranks of the really big plants of its kind in this country.

The sizes shipped and the yields of each, normally obtained from run-of-mine coal as it comes from the several pits are as follows: Six-inch lump, 20 per cent; 3x6-in. egg, 22 per cent; 2x3-in. nut, 28 per cent; $1\frac{1}{2}$ x2-in. nut, 7 per cent; and $1\frac{1}{4}$ -in. screenings, 23 per cent. These various sizes are prepared over inclined, balanced, shaking screens and all but the screenings are hand-picked on apron picking tables that terminate in loading booms. These latter may be elevated so that the product leaving any boom may be shot to a cross conveyor. Thus any desired combination of picked sizes or picked run of mine may be made.

The trimmers below the tipple have easy control of the movement of both the loading booms and the cars. The booms are raised and lowered by means of electric hoists and the cars are controlled by retarders. Thus the coal is not only lowered gently into place, but each car may be so trimmed as to assure maximum loading.

Pickings from the tables are thrown into refuse chutes and elevated by an inclined conveyor to a refuse bin near the dump house. From this bin they are discharged into special dump cars in which they are hauled back into the strip pits. Here they are dumped into the spoil bank or into the space that will later be occupied by it and covered up by dumpings from the stripping shovel. They are thus cheaply and effectively disposed of.

Coal arrives at the tipple in trips of twelve cars each. As may be seen in the accompanying illustrations the mine cars used in these pits are of special design. The track gage is 42 in, and as all loading is done by steam shovel no object is served in keeping the cars low. They are accordingly made somewhat higher than those intended for use underground where headroom may be important. In general appearance they somewhat resemble contractors' cars, but are of solid-body, non-dumping type. They have a maximum capacity of 6 tons of coal each, but as loaded by the shovels they hold on an average only about 5 tons.

At the headhouse these trips are discharged in a rotary dump, two cars at a time, without uncoupling. This device, which is air-actuated, is capable of making one dump every 30 sec., a whole trip of twelve cars having been discharged by it in 6 min. Ordinarily, however, this speed is not maintained, for if cars were dumped at this rate, the coal could not be suitably

sized on the screens nor carefully picked on the tables. From the bin under the dump the coal is fed by a reciprocating plate feeder to a conveyor by which it is delivered to the shaking screens.

The coal worked is the No. 5 bed of the Illinois series the thickness of which averages about 4 ft. 8 in. The overburden normally runs from 25 to 40 ft. thick although the coal comes to the surface in the sides of the ravines and creek valley. For the most part this overburden consists of clay and surface soil. However, some cap rock and slate are found immediately above the coal.

The coal is stripped, of course, by overcasting, successive cuts being taken in the overburden along the side of the pit and the spoil deposited in the space behind the coal berm. Four separate pits have been opened, each being supplied with its operating unit. In

strippings Nos. 1, 2 and 3 these consist of a Marion model 300 electric stripping shovel and a model 36 electric loading shovel. These stripping shovels have 6-cu.yd. dippers, 90-ft. booms, 56-ft. dipper sticks, a



Painless Tooth Extraction

No shooting is done in the overburden, and some of the digging in the cap rock overlying the coal is hard. When the teeth on the 8-cu. yd. dipper of the big stripper become worn down or broken they are renewed.



Big Shovel Discharging to Spoil Bank

The thickness of the overburden ranges from 25 to 40 ft., the material consisting chiefly of clay and soil, with some slate and rock immediately above the coal. Note the little portable compressor in the foreground. This furnishes air for sinking the shotholes and for cleaning the top of the coal bed preparatory to loading.

maximum reach of 102 ft. and a dumping height of 66 ft. The loading shovels have dippers of 2-cu.yd. capacity, which fill a trip of twelve cars in a surprisingly short time.

The fourth unit consists of a Marion model 350, 8-cu.yd. stripping shovel and a model 37 loading shovel.

This stripper is mounted on caterpillars whereas the others are mounted on track wheels. It is said to be the largest power shovel ever mounted on trucks of this kind. Consequently, a brief description of it will not be out of place.

Some of the important dimensions, weights, etc., of this machine are as follows: Length of boom, 90 ft.; length of dipper handle, 56 ft.; heaped capacity of dipper, 9½ cu.yd.; struck capacity, 8 cu.yd.; maximum height of dump above ground, boom at 45 deg., 71 ft.; greatest radius of dump at maximum height, 98 ft. and with handle level, 101 ft.; height of dump with handle level, 51 ft.; radius of cut at grade (1 ft. below ground surface), 69 ft.; radius of cut at 40-ft. elevation, 106 ft.; approximate working weight of machine with ballast, 1,175,000 lb.; length of upper frame, 46 ft. 10 in.; width of upper frame, 21 ft. 8 in.; hoisting motors (two), 175 hp. each; rotating motor, 105 hp.; crowding motor, 85 hp.; rated capacity of hoisting generator, 250 kw.; rotating generator, 75 kw.; crowding generator, 50 kw.; diameter of hoisting cable, 1½ in.; maximum tractive effort, 400,000 lb.; maximum bail pull, 100,000 lb.

The construction of the supporting and propelling device is such that the truck frames under each corner of the machine are entirely flexible in every direction and independently flexible toward each other. All eight belts are positively driven through gear trains, so designed as to be operative under all conditions of truck deflection. Each truck frame is 10 ft. 10 in. long from center to center of end sprockets, and each truck is fitted with an ample number of idling rollers, so that

traction shoes will not become wedged between rollers because of sharp inequalities in the ground. The sprockets have a pitch diameter of 36 in., and one of each pair is adjustable so that proper tension may be maintained on the belt.

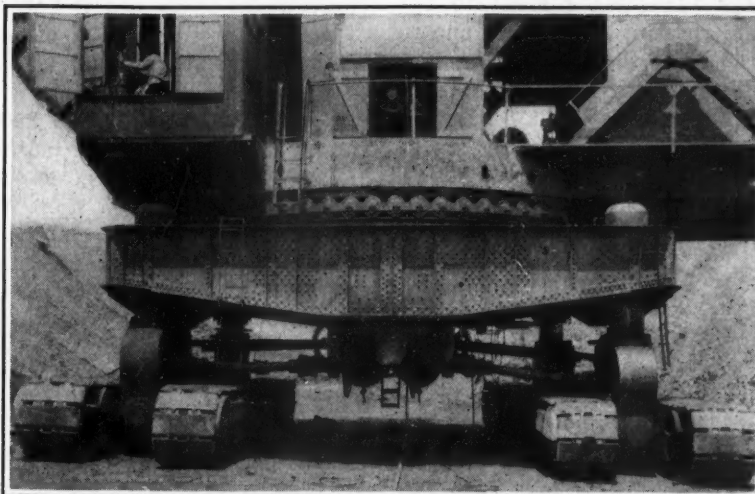
Propelling effort is transmitted from the gears on

the lower frame to each truck assembly through universal joints and telescoping shafts. The arrangement is such that under all ordinary conditions these shafts do not drive through an angle but in a straight line. The minimum clearance between the gears and telescoping shafts and the ground is about 3 ft. 6 in. All telescoping shafts, universal joints and gears in the spider castings are carried above the traction belts, so that no dirt, stones or other foreign material can fall into them. The

top of the lower frame is normally 11 ft. above the ground, and the upper-frame deck plating is 16 ft. 6 in. above ground level.

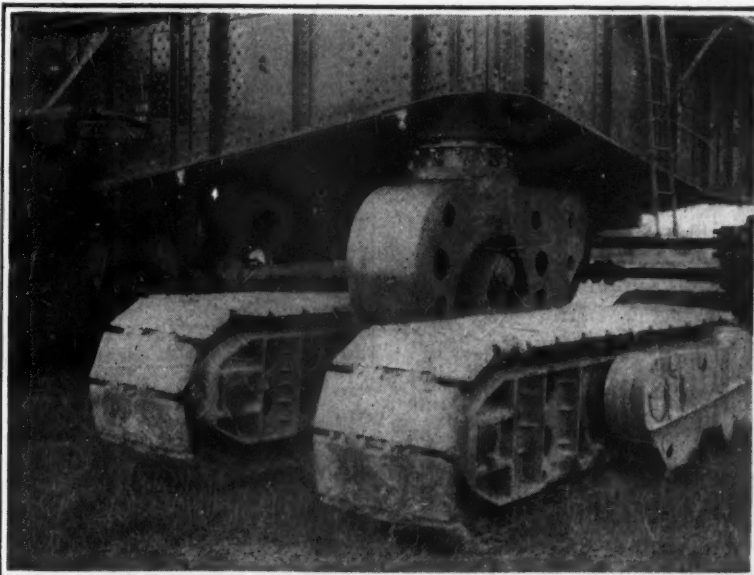
All castings, gears joints and the like in the traction assembly are made of heat-treated vanadium steel assuring ample strength. The speed of machine movement varies somewhat with conditions. With motors operating at normal speed, the movement of the machine will be approximately 0.2 miles per hour. On firm level ground, as when operating on top of the coal bed, this speed may be increased by about ¼, or to 0.3 miles per hour. The lower frame of machine is

supported from the trucks by means of four hydraulic equalizing cylinders, one at each corner. These cylinders are of forged steel, and the pistons working in them are of cast-nickel iron possessing extreme strength and toughness. Each piston and cylinder is subjected to 2,500 lb. per square inch of hydrostatic pressure before going into service. This equalizing device is claimed to afford the flexibility of three-point suspension and to permit the machine to be operated on or moved over uneven



Caterpillars and Main Frame with Means of Levelling Latter

This view well illustrates not only the mounting and propelling mechanism but it shows how the underframe may be leveled. Note how much farther the hydraulic equalizing pistons on the right are pushed out of their cylinders than are those on the left side of the machine. This equalizing device not only enables the shovel to operate on a grade with the turntable level but allows it to traverse uneven ground without torsionally straining either the upper or lower frames.



Close-up of One of the Four Trucks Under the Shovel

Each shovel truck is composed of two caterpillar chains and their mountings, the pair carrying one of the equalizing hydraulic cylinders that support the four corners of the under frame. Alloy and heat-treated steels have been freely used in the construction of this device.

ground without subjecting the lower frame to torsional stresses. It also permits the shovel to be leveled when working on a grade.

This machine is equipped with a motor-generator set consisting of a 3-phase, 60-cycle, 2,300/4,000-volt synchronous motor driving three 250-volt direct-current generators. One generator furnishes current to the hoisting motors, one to the rotating motor and one to the crowding motor. The speed of these various motors is changed by regulating the voltage, a rheostat in each generator field being provided for that purpose. Resistance is varied by means of master controllers at



Loading the Coal That the Big Shovel Has Stripped

Each trip of cars holds approximately 60 tons of coal, but the 2-cu. yd. loading shovel can fill it in a surprisingly short time. As the machine, also, is caterpillar-mounted it can move up without delay.

the operator's station. Provision is made for automatically limiting the current taken by each machine to a value that will develop the maximum torque required. Each motor is provided with a control panel.

EQUIPMENT GROUNDED THROUGH FRAME

The little motor that trips the dipper is wound for 115 volts direct current. It draws its energy from the exciter and is controlled from a small hand lever on the hoisting controller. The frames of all motors and contactor panels, and those of the motor-generator, meter panel, reversing-switch panel, controller, compensator and rheostat are grounded to the shovel frame. The cable reel is mounted in a suitable support attached to a girder of the lower frame. This reel is provided with slip rings and brushes, and the same means are employed for transmitting current from the lower to the upper frame through the central journal.

Three 7½-kva. single-phase, 2,300/4,000-volt primary and 110/220-volt secondary transformers are installed on the upper frame for operating a direct-connected, motor-driven air compressor that supplies air for operating the lock brakes and hoisting ram. They also furnish current for the lighting circuits on the upper frame. A like number of similar transformers, but of 1½-kva. capacity are installed on the lower frame for operating the hydraulic pump forming part of the equalizing system and also the lighting circuits on this portion of the machine. Simplex No. 2, 5,000-volt cable is used to supply current to this shovel.

Two 175-hp. modified series-wound mill-type motors are used on the hoist. Each is equipped with a brake wheel on its armature shaft that has a diameter of 24 in. and an 11-in. face. Contracting brake bands are automatically applied to these wheels when current is shut off from the hoist motors, and the brakes are

released when current is turned on. They are actuated by a system of levers carrying a weight and by a small air cylinder, the arrangement being such that they are "gravity-set and air-released." A valve operated by a magnet wired to the master hoist controller automatically controls the air. An independent foot-operated check brake is applied to the hoist drum.

Hoisting speed of the dipper varies, from nothing when the maximum pull is being exerted, to 250 ft. per minute when hoisting empty. Average digging speeds range from 150 to 250 ft. per minute according to the nature of the material being handled.

The rotating motor is of the open mill type with a 60-min. rating of 105 hp. An automatic lock brake is provided on the armature shaft similar to those employed on the hoist motors and is operated in a like manner. The speed of rotation is approximately two full revolutions of the shovel per minute or a possible operating speed of 40 sec. per 100 deg. of swing and return. The average obtained in operation is approximately one such swing in 50 sec.

"BUILT-UP" BOOM IS 90 FT. LONG

The 90-ft. all-steel boom is of the "wide spread" type, that is, it is built up of two main girders 20 ft. apart, center to center, at the base and 2 ft. 4½ in. apart at the peak. The crowding machinery is carried on a heavy steel-casting frame bolted to two supplementary girders in the boom center.

The crowd motor is of the modified shunt-wound inclosed mill type. It is similar in general construction to the rotating motor except that it is inclosed in a weatherproof shield. The intermediate shaft carries a contracting-band lock brake that is automatically air-operated. The main cable sheaves at the boom peak have a diameter of 72 in.

The engineer's stand is at the front of the upper frame to the left of the boom and so arranged that he can at all times have a clear view of the work. Heavy-duty controllers govern the three major motions of hoisting, swinging and crowding. The swing controller is operated by the left foot. Only a slight



"300" Shovel Moving the Surface Material

This is a view in the No. 2 strip pit. The stripper shown has a 6-cu.yd. dipper and a reach of 102 ft. from the center of the machine. It is similar to the shovel in No. 4 pit but is mounted on wheeled trucks traveling on rails. As track must be provided for it, its movements over appreciable distances are comparatively slow.

pressure on the small trip lever is required to discharge the dipper which is given a reverse draft to insure the material sliding through easily and quickly.

After the coal has been stripped, its surface is cleaned. In these pits air is used for drilling, the shot-holes being put down by jackhammer drills. A portable

mine-car compressor supplies air at the desired pressure. Air is used also for blowing off the top of the coal, being both rapid and effective in its action. It leaves the surface of the coal bed unusually clean and practically free from all foreign matter.

Hollow steel (through which the exhaust may be turned) is used in the shothole drill. This blows the cuttings out of the hole and permits rapid drilling. The holes are loaded with ordinary black blasting powder and fired by means of squibs and a firing barrel or piece of $\frac{1}{4}$ -in. pipe, the cuttings from the hole being used as stemming. The shooting is not heavy, the surface of the coal merely rising a little and then settling back.

Current for this stripping operation, including that consumed at the tippie, is purchased from the Central Illinois Public Service Co. It reaches the property at 33,000 volts, but this potential is stepped down in an outdoor transformer station to 4,400 volts. It is carried at this pressure into the motor-generator sets on the stripping shovels. These machines generate direct current at 250 volts, at which potential energy is supplied to the hoisting, swinging and crowding motors. All shovel buckets trip electrically.

The model 37 loading shovel is provided with a motor-generator set like the big strippers, and its various motors are controlled in a similar manner. The model 36 shovels on the other hand use friction clutches instead of voltage regulation to insure proper speed variation. Steel ties are being used experimentally in one of the pits, but in the others wooden ties are employed.

These four strip pits are operated by a mine manager and four assistants, one in charge of each pit. An electrician and a master mechanic are also employed. About 150 men all told are on the payroll at this operation. During the month of June, 1926, about 80,200 tons of coal were produced. Approximately 6.86 kw.-hr. of electric energy is consumed per ton of production.

Stripping will doubtless always be a favorite method of mining where conditions are favorable. Heretofore it has been considered necessary to mount the big strippers on trucks running rails as it was believed that caterpillars could not be made sufficiently strong. The big shovel at Cuba, however, has now been in operation for several months, and its mounting has given no particular trouble.

It is in "moving back" after a cut that the great advantage and economy of the caterpillar mounting becomes most manifest. A move that would require from 4 to 5 hr. with one of the older shovels may be

accomplished by the new one in approximately 20 min.

During the month of July, 1926, the smaller shovels handled an average of slightly over 119,600 cu.yd. of overburden whereas during the same period the caterpillar-mounted machine handled 176,069 cu.yd. This shows the digging capacity of the newer machine to be

approximately 48 per cent greater than that of the older machines. Incidentally the new shovel has harder digging than the older machines because it has encountered more rock and shale.

Expensive mechanical devices are profitable to exactly the extent that they can be kept in productive operation. The caterpillars on this machine, therefore, not only cut down the shovel crew from 5 to 3 men (for no track layers are needed) but materially decrease the unprofitable time during which the machine is being moved from one place to another.

Strip-pit operation still continues to make advances. The coal which at one time arrived in the market unclean and undesirable is now obtained in good condition, partly because the top of the seam is well swept by air or broom and partly cause the coal uncovered today is because the coal uncovered today is deeper and better protected than in the past.



Drilling and Blasting

One man is shown putting down a shothole with a small pneumatic drill, and the one behind him is busy loading a hole already sunk. The irregular white band crossing the foreground is a horseback. This might be troublesome if the coal were worked by underground methods but gives no trouble here. The apparently indistinct place between the driller's right foot and the horseback is caused by cuttings which after issuing from the hole have been blown a few feet by the wind.

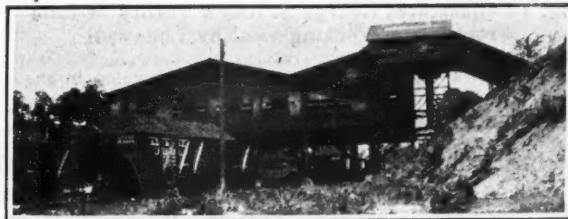
Which of the Coal Carbonization Processes Is Likely to Survive?

Speaking before the Division of Gas & Fuel Chemistry, of the American Chemical Society, at its Philadelphia meeting, Sept. 6, Prof. S. W. Parr will say in

effect in the course of a paper on "Future Trends in Low-Temperature Carbonization": Low-temperature carbonization retains all its initial interest in spite of the adverse industrial circumstances confronting its introduction. Doubtless the "fittest" among the various processes will survive, and they will be fit only if they embody low cost of installation, large through-put and

moderate operating costs with products of real industrial value."

S. R. Church at the same meeting will describe the tars obtained in the two-stage carbonization process developed by Prof. Parr. These tars, Mr. Church declares, differ sharply from those resulting from any of the so-called "low-temperature carbonization" processes in Europe and the United States, so far as these have been examined by Mr. Church or disclosed in the literature of the subject. An important feature of the new tars is their high content of tar acids, falling in the boiling range of phenol and cresols and not in the higher boiling range characteristic of low-temperature tars.



Tippie as Viewed from Lower Side

Five grades of coal are normally shipped from this mine. In addition picked run of mine or any combination of lump, egg and nut sizes may be made. This arrangement is extremely flexible and well suited to meet any and all market conditions.

How Roof of Long-Face Working, Henryetta, Okla. Broke When Coal Was Extracted

Roof Fractured at Back of Cut on Angle of Sixty Degrees Projecting Over Extracted Area—Timber Break Row Not Under Heavy Pressure—Ancient Slip Fault Causes Temporary Abandonment of Successful Experiment

By E. F. Woodson

Henryetta, Okla.
General Superintendent, Crowe Coal Co.,

LOADING MACHINES, face conveyors and other mechanical means of mining and loading coal necessitate a change in the plan of the working face. With coal beds 5 ft. thick and under, the most economical arrangement is one having a longer working face than the 16 to 40 ft. which is the width where the coal is mined by room-and-pillar methods.

If the roof and all other conditions are suitable to the longwall system, it should be used, conveyors or scrapers being employed at the face instead of mine cars. Where longwall is not deemed advisable, a shortwall system could be used in its place.

The Crowe Coal Co. decided in the summer of 1924 to endeavor by the introduction of wide faces and conveyors to reduce its labor cost and improve the quality of its coal. The conditions in the Henryetta field where the experiment was tried were as follows: Coal 2 ft. 8 in. to 3 ft. 2 in. thick, dipping $1\frac{1}{2}$ per cent to the west and being underlaid with fireclay having hard siliceous fossils embedded in it. The fireclay is 6 to 8 in. thick, and under it lies a fine-grained, thinly bedded sandy shale.

The coal seam contains no water. Whatever water enters the mine comes from the cracks which form in the roof when the overburden is broken to the surface. The roof immediately over the coal is of a good quality of blue shale.

MAIN ROOF OF BLUE AND SANDY SHALES

Above that stratum lie 200 or 300 ft. of overburden consisting of blue and sandy shales. These shales near the surface alternate with thin layers of thinly bedded fine-grained sandstone. Throughout the field room-and-pillar methods are used, the seam being undercut by shortwall machines operating in the coal. The rooms are 42 ft. wide. It may be added that the entire field at the time of making the experiment was strongly unionized.

In the early days of this field, longwall had been tried under light cover, but it had not been considered

a success. Later the Victoria Coal Co. tried a longwall system and was reported to be successful in operating it, having had already the first and second roof breaks, but the company could not arrange with the union for a wage scale on a comparative basis with room-and-pillar work and were compelled to abandon the experiment.

TEST MADE IN SUMMER OF 1924

In the summer of 1924, I designed a sectional face conveyor, consisting of 18-ft. intermediate sections, one

tail section, one vertical-curve section and one combination drive-and-loading section. The coal was dragged by two riveted chains connected by $1\frac{1}{2} \times 1\frac{1}{2} \times 16$ -in. angle irons set 18 in. apart. These chains ran in a sheet-iron trough, 24 in. wide at the top, 22 in. wide at the bottom and 4 in. deep. The chains returned under the trough resting on two angle irons set 2 in. above the floor.

The total height of the conveyor above the floor was 13 in. The drive and curve sections conveyed the coal upward high

enough to discharge it into the mine car on the entry, thus making bottom brushing unnecessary and eliminating a needless expense.

The sections were connected by a special joint that would permit of the conveyor being laid out of line $1\frac{1}{2}$ deg. in a vertical direction at any one of the 10-ft. sections. Consequently in three joints a change in alignment of $4\frac{1}{2}$ deg., either up or down, could be made.

ONE CONVEYOR HANDLES ALL FACE COAL

The shortwall face for the conveyor was planned to be 200 ft. long and was located so as to be at right angles to the entry, so that the conveyor would transport the coal along the face and deliver it to a car on the entry track. It was the intention to break the roof behind a break row of timbers after each cut and not to allow a gradual settlement of the roof as in longwall mining.

With this mining method in mind and with the intention of not letting the members of the United Mine Workers of America know what the plans were

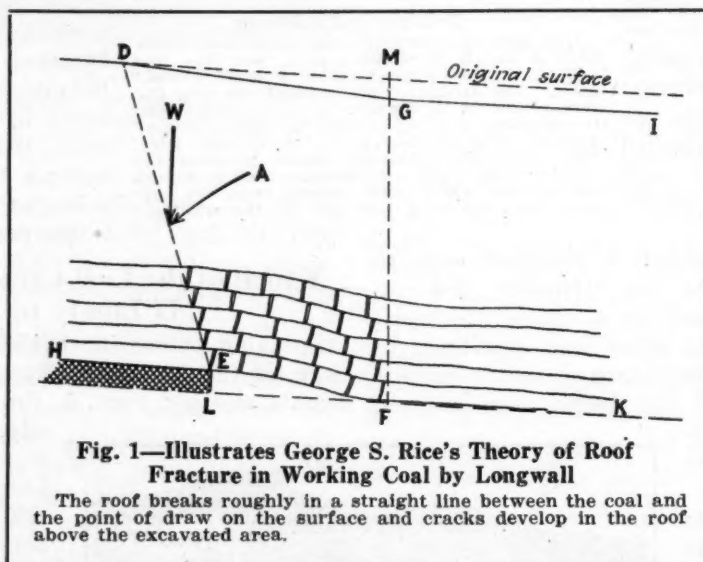


Fig. 1—Illustrates George S. Rice's Theory of Roof Fracture in Working Coal by Longwall

The roof breaks roughly in a straight line between the coal and the point of draw on the surface and cracks develop in the roof above the excavated area.

Paper Entitled "Roof Pressures on Long Faces" presented at the Convention of Mine-Operating Officials of the American Mining Congress which met at Cincinnati, Ohio.

The breaks *LY* and *MN* which occur after each cut are shear breaks extending over the broken ground at an angle of 60 to 70 deg. to the horizontal. The surface of these breaks is smooth to the touch, and they produce a powder as fine as flour, which could be formed only by the strata slipping under heavy pressure along a break or joint. The line of this break is evidently in the direction of the resultant of two forces, one *W* representing the direction of the weight of the overburden and the other *A* possibly acting at some other angle than vertical and if so representing forces set in operation by arch action. The force designated by *A* might be considerable, if, as assumed, the roof strata between and above the points *F* and *L* are rolling forward toward the caved area. Force *A* would exert its maximum pressure when stopped at the point *L* by encountering solid strata above, and overhanging, the coal seam. The force *S* represents the resultant of these two forces *A* and *W* and the direction of its action.

SHEAR BREAK FORMS AS CUT IS MADE

During the experiment it was always found that the shearbreak *LY* followed the mining machine across the face at the back of the cut, that ordinarily the roof between *Y* and *N* dropped from $\frac{1}{2}$ to $\frac{1}{4}$ in. and seldom showed cross breaks of any nature, that the timbers between *Y* and *N* showed only slight pressure, that after the cut of coal *PRYZ* was loaded out one prop for each 8 ft. of face was about all the timber required until the break-row timbers from under section *YN* were removed. When, however, these were drawn the pressure would increase on the timbers between *R* and *Y*. The roof strata *LYNM* would fall after the timbers were removed from under it.

The lack of pressure on the timber between *R* and *Y* while the coal over the cut was being removed proves that the weight of the overburden was not carried by the props in that section. It could not have been carried by the strata *HLIX* acting as a cantilever, as the shear break at *R* had already occurred. The strata *MNOK* were all broken material, and the surface *MN* of the broken ground could not carry this weight by friction as a crack of a small part of an inch existed there. The weight of the overburden over this section *RY* must therefore be carried by an arch having as abutments the line of draw *LD* and the settled broken ground *MNOK*.

The strata *MNOK* were certainly broken to a height of more than 25 ft. but how high this breakage extended could not be ascertained. Sound engineering judgment would teach us to endeavor to make the height of this broken ground extend well above the top of the coal bed. If it were possible to regard the overburden as a plastic material the total pressure *S* could be estimated as if acting at a point $\frac{1}{3}$ of the depth of the cover above the line *HK*. If this pressure could be controlled, mining engineers would want it to act on the coal seam several cuts ahead of the conveyor face.

CLOSE PROPPING BETTER THAN CRIBBING

To produce the best breaks the props should be set tight in the break rows, props should be set instead of cribs and all timbers should be removed from the sections that are being caved. There should be at least 2 ft. of clear space between the gob and the roof under the sections being caved so that the upper limit of the broken strata will be well above the roof of the coal bed.

If the roof is breaking properly a shear break will follow the advancing face along the rib on each side of the caved area. In the experiment a gob entry was driven with the gob on the opposite side of the entry from the caved area, and the only trouble experienced was a little extra brushing of loose material over the entry. This had to be done to keep the roadway safe for men and mules.

Because of the fault already mentioned the experiment did not prove a financial success. Even though the coal was being extracted from under the loose-ended overburden caused by the fault, not a section of the conveyor was lost and the face was never closed, although on the last two cuts the sections of roof strata on the inside half of the conveyor face settled about 6 in. and mushroomed the break-row timbers. Sufficient knowledge was gained of the roof conditions at the mine to convince those who made the experiment that the caving system would be successful in an area where no faults existed.

No attempt has been made at this mine to open up another conveyor face because the mines are now being worked on the 1917 wage scale, and the working forces are not sufficiently well organized to make the attempt.

Transport Screenings to Washery by Air

At Bestwood Colliery, near Nottingham, England, 40 tons of coal an hour are transferred from the screening plant to the washery by air, a distance of nearly 200 yards, says *Colliery Engineering* of London. The tippie has a shaking and a rotary screen. The coal from each of these falls into a 20-ton hopper shaped like a truncated cone measuring 14 ft. in depth, 18 in. at the bottom and 17 ft. 10 in. at the top.

An 8-in. diameter coal-conveying pipe is led to the bottom of these hoppers and is fitted with a special form of nozzle which operates on the injector principle. A pipe of 3-in. diameter fitted with a wire guard at the entrance and a valve to regulate the air supply affords the necessary intake. This pipe is long enough not to be buried by the coal in the hopper. A connection is made with the coal pipe about 18 in. from the end. The function of the air pipe is by the admission of free air to prevent the choking of the nozzle when the end is buried.

The conveying pipes are in each case brought out of the hoppers at an angle of about 30 deg. and then curved to the horizontal. They are kept high enough to clear loaded trucks, etc. They deliver the coal to two cyclone dischargers. The mixture of coal and air on entering the large area of the discharger has its rate of flow checked, and all the coal except the fine dust falls immediately into the inverted-cone-shaped receiver.

Thence it is removed by a big valve which holds 448 lb. This works automatically, being opened when the weight indicated is attained, the exit of air being blocked by the automatic action of two flap valves. The discharged coal can be filled either into a car or into a hopper from which it is raised to the washer by a bucket-type elevator. Two exhaustor pumps are provided one for each unit and each capable of exhausting 2,150 cu.ft. of air per minute with a vacuum of 12 in. of mercury. The exhaustors consist of an impeller, embodying vanes on a shaft, which revolves within an oval casing which latter contains water. Between the rotating blades and the water, the air is entrapped.

Confining an Explosive Reduces Carbon Monoxide And Hydrogen Content of Resultant Gases

Compression and Stemming Also Increase Methane Content—All the Most Common Explosives Have Less Oxygen Than Will Convert All Carbon to Carbon Dioxide and All Hydrogen to Water Vapor

By J. E. Crawshaw and G. W. Jones

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A PREVIOUS ARTICLE* in the *Engineering and Mining Journal-Press* described an experimental apparatus for studying the gaseous products of detonation liberated by explosives under conditions of confinement nearly approaching those under which explosives are used in mining operations.

Numerous investigations of the gases liberated by explosives have shown that carbon dioxide (CO_2), water vapor (H_2O), carbon monoxide (CO), hydrogen (H_2), methane (CH_4), nitrogen (N_2), and sometimes oxygen (O_2) are most commonly present in appreciable quantities in the gaseous products of detonation of explosives, and that other gases, notably ammonia (NH_3), cyanogen (CN), cyanogen compounds and, under certain conditions, oxides of nitrogen may be present as traces.

In addition to the above, hydrogen sulphide (H_2S), and sulphur dioxide (SO_2), may be found in the gases from explosives which contain sulphur or some sulphur compound as an ingredient. However, as few of the common permissible explosives contain ingredients which would give H_2S or SO_2 on detonation, these gases will not be considered in this article.

The proportion of each of the gases mentioned that will be present largely depends upon the composition of the explosive, particularly on the oxygen content of the ingredients. Where the ingredients of the explosive contain just enough oxygen to unite with all the combustible elements—C and H,—present in the explosive (including the wrapper) to form CO_2 and H_2O , the explosive is called "balanced," and the gases on detonation will consist of CO_2 , H_2O , N_2 , and traces of the other gases.

Where more than the above oxygen content is present the explosive has an "oxygen excess" and the oxygen will be found among the other gases. When there is insufficient oxygen to unite with all the C and H, to

form CO_2 and H_2O , the explosive is said to be "deficient in oxygen," and the gases on detonation will contain CO_2 , CO , H_2 , CH_4 , and N_2 . It is with this class of explosives that the effect of confinement would be expected to be greatest. Though all the most common explosives belong to the class deficient in oxygen, it is evident that the class chosen for this investigation should have a wide range in deficiency in oxygen, and as the permissible explosives furnish this requirement they were selected.

Before adopting a standard method of procedure for the investigation there were certain factors which it appeared should be first studied—namely, the position and size of the electric detonators, the effect of the air

Table I—Composition of Explosive Used to Test Effect of Stemming

Constituent:	Per Cent
Moisture	1.10
Nitroglycerin and nitropolyglycerin	9.47
Commercial ammonium nitrate	78.35
Calcium carbonate	0.77
Carbonaceous combustible material	10.31
	100.00
Ammonium chloride	0.86

Where the ingredients of the explosive contain just enough oxy-

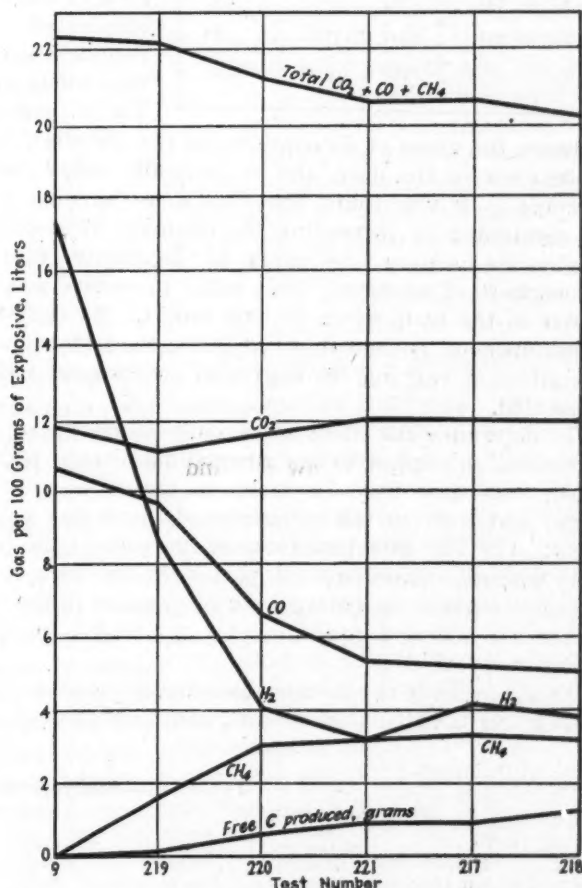


Fig. 1.—Gases Produced by Detonation with Varied Degrees of Confinement

The confinement increases from left to right, not, however, in a degree directly proportional to distance as plotted on the chart. It will be noted that the total gas product and the quantity of carbon dioxide in the gases formed remains but little affected by confinement, but the quantities of carbon monoxide and hydrogen are notably decreased and methane and free carbon quite definitely increased.

Published with approval of Director, U. S. Bureau of Mines. Experiments have been made by the U. S. Bureau of Mines to ascertain the effect of confinement on the composition of the gaseous products liberated in the detonation of permissible explosives. The general result of these experiments has been to show that with explosives deficient in oxygen, and all the most common explosives are of that type, the carbon-monoxide and hydrogen content will be decreased. These conclusions can be applied directly to mining practice, as they show the benefit to be gained in the reduction of poisonous gas (CO) by firing the explosive properly confined by plenty of well-tamped stemming.

*Crawshaw, J. E., and Jones, G. W., An apparatus for studying gases of explosives detonated under confinement. *Engineering and Mining Journal-Press*, Vol. 120, 1925, pp. 965-967.

Table II—Effect of Confinement on Gaseous Detonation Products from a Permissible Explosive

Test No.	Confinement	Stemming	Gas at 0° C. and 760 mm. Hg Produced per 100 Grams of Explosive, Liters				Total Liters CO ₂ +CO+CH ₄	Equivalent Grams Carbon	Free Carbon Grams	CO/CO ₂ Ratio
			CO ₂	CO	H ₂	CH ₄				
9	Very slight. Explosive fired in 15 liter Bichel gage in <i>vacuo</i>	None	11.70	10.65	17.35	0.00	22.35	12.00	0.00	0.91
219	Slight. Laid in 21 in. x 21 in. borehole of cannon	None	11.05	9.65	8.60	1.60	22.20	11.90	+0.10	0.87
220	Packed in back of borehole of cannon confined on all but one side	None	11.50	6.60	4.05	3.05	21.15	11.40	+0.60	0.57
221	Confined on all sides. Fireclay stemming packed against charge	1 lb.	11.95	5.35	3.20	3.20	20.50	11.00	+1.00	0.45
217	Confined on all sides. Fireclay stemming packed against charge	2 lb.	11.95	5.25	4.15	3.35	20.55	11.10	+0.90	0.44
218	Confined on all sides. Fireclay stemming packed against charge	3 lb.	11.90	5.05	3.80	3.15	20.10	10.80	+1.20	0.42

in the apparatus, and the effect of varying the degree of confinement.

This preliminary investigation showed that, (1) provided that an electric detonator, the equivalent of a No. 6 detonator, containing 1 gram of a KC10-Hg fulminate mixture (the lowest grade of detonator in general use in America) is used, the size of detonator has no appreciable effect on the composition of the gases; (2) if at least 1 lb. of dry fireclay is used as stemming, the position of the detonator is immaterial;

Table III—Reactions Possible on Detonation or Thereafter

$C + O_2 = CO_2$	(1)
$2C + O_2 = 2CO$	(2)
$2H_2 + O_2 = 2H_2O$	(3)
$CO_2 + C \rightleftharpoons 2CO$	(4)
$C + H_2O \rightleftharpoons CO + H_2$	(5)
$C + 2H_2 \rightleftharpoons CH_4$	(6)
$CO + 3H_2 \rightleftharpoons CH_4 + H_2O$	(7)
$CO + H_2O \rightleftharpoons CO_2 + H_2$	(8)

between the gases of detonation and the air often takes place even in the open and is generally called "after burning." It was found that this after burning could be eliminated by increasing the quantity of stemming or by discharging the gases of detonation into an atmosphere of nitrogen. This latter procedure was followed in the tests given in this report. As the effect of confinement is the subject at issue, the tests showing the effect of varying the degree of confinement will be presented.

To determine the effect of varying the degree of confinement, an explosive (an ammonium-nitrate permissible) was first fired in *vacuo* in the 15-liter Bichel gage, and then in the experimental apparatus as follows: (1) The cartridge loose in the back of the borehole without stemming; (2) packed in the back of the borehole without stemming; and (3) packed in the back of the borehole and tamped with 1, 2, and 3 lb. of stemming, respectively.

For these tests the permissible selected contained only nitroglycerin, ammonium nitrate, and carbonaceous com-

bustible material, and no ingredients which would leave a solid residue, as it was hoped these tests would give some indication of the equations involved, and it was thought that ingredients such as sodium nitrate and sodium chloride, which are commonly used in permissible explosives, might make the results more difficult of interpretation. This explosive was so deficient in oxygen, the gases on detonation gave relatively large quantities of CO, H₂, and CH₄. The analysis of the explosive used is as in Table I. The wrapper constituted 9.4 grams per 100 grams of explosive ingredient.

Table II gives the results of this series of tests and Fig. 1 shows them graphically. The resultant gases are given in liters per 100 grams of explosive, and in the figure these results are arranged in the order of increase in degree of confinement. In test 9 there were 219 grams of explosive used, and in the other five tests, 164.1 grams. The gases were discharged into an atmosphere of nitrogen.

The results may be summarized as follows: As the confinement increased, the CO and H₂ materially decreased, the CH₄ and free C deposited increased, and the total carbon-containing gases decreased. The CO₂ did not vary appreciably.

Most of change has taken place between the conditions of vacuum in the Bichel gage and tamped in the cannon with one pound of stemming. Additional stemming did not have an appreciable effect on the composition of the gases.

MORE CONFINEMENT, MORE FREE CARBON

The decrease in the total quantity of carbon-containing gases as the confinement increased indicates the deposition of greater quantities of free carbon, otherwise this total should remain constant.

At the instant of explosion it is generally believed that the different chemical elements are present either in the atomic state or in the lowest form of oxidation. These elements combine and recombine, and the final products depend upon the conditions of pressure and temperature and the concentration of the reacting gases. The effect of the increased pressure from the greater confinement will be to shift the equilibrium of the secondary reactions in the direction which is accompanied by a decrease in volume, thereby causing a change in concentration of the gases, which will affect the equi-

Table IV.—Analysis of Explosives Used in Tests, Per Cent

Sample No.	Moisture	Nitroglycerin and Nitropoly-Glycerin	Ammonium Nitrate	Sodium Nitrate	Ammonium Chloride	Sodium Chloride	Ant-Acid	Carbonaceous Combustible Material	Weight of Wrapper per 100 Grams of Explosive Ingredient, Grams
2	0.35	10.32	74.03	1.87	.....	6.99	0.51	5.93	7.8
4	1.10	10.05	65.03	14.68	0.81	.....	0.85	7.48	8.9
1	0.56	9.78	73.88	1.26	.....	7.60	0.76	6.16	7.7
3	0.68	9.85	73.73	6.63	1.18	.....	0.96	6.97	8.5
5	0.90	8.81	63.05	15.13	1.55	.....	0.74	9.82	8.8
6	0.72	9.98	74.72	4.53	0.45	.....	0.61	8.99	9.0
8	0.65	9.43	79.68	.....	0.65	.....	0.14	9.45	10.0
10	1.04	8.56	68.56	.....	2.32	9.28	0.46	9.78	10.0
11	0.56	9.68	69.47	.....	.....	10.29	0.19	9.81	10.4
7	0.92	8.72	70.37	.....	.....	10.22	0.91	8.86	9.0
12	1.13	9.78	76.56	0.87	0.14	.....	0.51	11.01	9.8
9	1.10	9.47	77.49	.....	0.86	.....	0.77	10.31	9.4
14	3.07	17.17	.....	36.56	.....	0.70	-0.80	41.70	7.4
13	6.71	25.86	.....	30.34	.....	0.59	0.86	35.64	7.6

Table V.—Composition of the Gases on Detonation

(Fourteen samples of permissible explosives when fired *in vacuo* and in a cannon stemmed with one pound of stemming)

Sample No.	Vacuum in Bichel Gage Gas at 0° C. and 760 mm. per 100 Grams of Explosive, Liters						Pressure Apparatus, 1 Pound of Stemming Gas at 0° C. and 760 mm. per 100 Grams of Explosive, Liters					
	CO ₂	CO	H ₂	CH ₄	CO ₂ +CO +CH ₄	CO ₂ Ratio	CO ₂	CO	H ₂	CH ₄	CO ₂ +CO +CH ₄	CO ₂ Ratio
2	11.10	4.35	7.00	0.35	15.80	0.39	11.60	3.20	2.30	1.95	16.75	0.28
4	12.00	4.85	8.15	0.20	17.05	0.40	12.70	4.25	2.80	2.25	19.20	0.33
1	12.15	4.95	7.65	0.35	17.45	0.41	11.40	3.35	2.10	1.70	16.45	0.29
3	12.45	5.65	9.90	0.00	18.10	0.45	12.30	3.65	1.30	2.15	18.10	0.30
5	11.05	7.45	12.65	0.25	18.75	0.67	11.65	4.20	2.95	2.85	18.70	0.36
6	13.05	7.70	12.60	0.00	20.75	0.59	12.70	5.75	4.30	1.75	20.20	0.45
8	12.65	8.10	12.80	0.00	20.75	0.64	11.30	6.25	3.50	1.75	19.30	0.55
10	10.55	9.10	13.95	0.25	19.90	0.85	10.00	5.00	3.10	3.35	18.35	0.50
11	11.10	9.55	14.65	0.00	20.65	0.86	11.15	5.55	2.95	2.20	18.90	0.50
7	10.70	9.85	14.90	0.00	20.55	0.92	10.80	5.45	3.10	2.95	19.20	0.50
12	12.05	10.10	18.15	0.00	22.15	0.84	11.90	5.55	3.05	2.95	20.40	0.47
9	11.70	10.65	17.35	0.00	22.35	0.95	11.80	5.85	4.10	3.70	21.35	0.50
14	10.10	18.45	15.65	4.70	33.25	1.83	10.10	11.95	4.40	4.50	26.55	1.17
13	10.50	20.15	19.75	2.20	32.85	1.92	12.10	15.35	6.35	5.75	33.20	1.27

librium of those reactions which are not accompanied by the decrease in volume.

As a rule, the chemical elements present in an explosive are C, H, O, and N. The chemical reactions or their combinations may take place on detonation of an explosive deficient in oxygen and in the subsequent secondary reactions; are as in Table III. of these, (1), (2), and (3) need no discussion. In (4), (5), (6), and (7) where the volume change is large, it would be expected that increased confinement would have a marked effect and in the direction of decreased volume as shown by the arrow. Reaction (8), whose equilibrium is unaffected by increased pressure alone, would take place in the direction shown by the arrow due to the change in concentration of CO₂ and CO from the other reactions.

For further investigation of the effect of confinement on the composition of the gases on detonation, fourteen permissible explosives were selected from the Bureau of Mines' list of permissible explosives which, from their composition and classification by amount of toxic gases produced in the Bichel gage, would give a wide range in oxygen deficiency. Table IV gives the chemical composition and the weight of wrapper per 100 grams of explosive ingredient.

As the preliminary investigation had shown that the

change in confinement between vacuum in Bichel gage and packed in the back of a borehole and confined with one pound of stemming, afforded sufficient pressure to bring the results (composition of the gases) practically constant, each explosive was tested under these two conditions for the comparison.

DISCHARGE GASES INTO NITROGEN

In these tests in the experimental apparatus the gases were discharged into a nitrogen atmosphere containing less than 2 per cent of oxygen to prevent, as far as possible, any after burning. Table V gives the results of these tests and Fig. 2 shows the effects of confinement on the different gases. In both the table and figure the explosives have been listed in the order of the production of toxic gases in the Bichel gage *in vacuo*.

From Table IV and Fig. 2 it is seen that in general the conclusions of the effect of the composition of the gases through increased confinement, drawn from tests with one explosive, apply to all of the explosives tested. These conclusions are that with an explosive deficient in O₂, the CO₂ will be practically unchanged, CO will be decreased, H₂ decreased to a greater extent, and the CH₄ increased. It will also be noted in general that the greater the deficiency in oxygen the greater is the decrease in H₂ and CO, and the increase in CH₄.

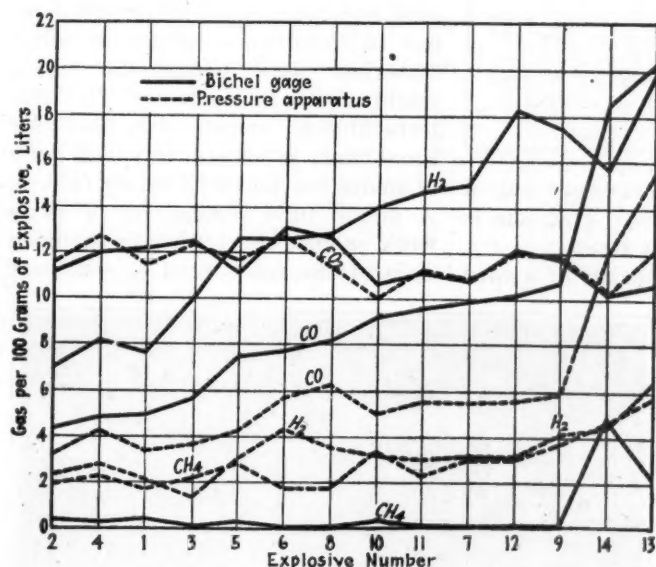


Fig. 2.—Comparison of Gases Produced with Bichel-Gage and Pressure-Apparatus Tests

The results are arranged according to the production of carbon monoxide in the Bichel gage. In using this gage the explosive is fired in a vacuum, and it will be noted what large quantities of hydrogen and carbon monoxide are made as compared with those generated when the pressure apparatus is used, where the explosive was packed in the back of a borehole and confined with 1 lb. of stemming.

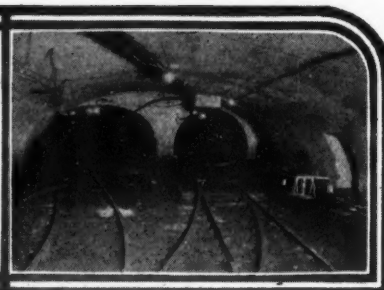
Progress in Underground Communication

Studies recently completed by engineers of the Bureau of Mines attached to the Bureau's experiment station at Pittsburgh, Pa., have demonstrated that voice signals can be transmitted in and out of a mine, through more than 400 ft. of underlying strata by the use of dry cells as a source of electrical energy and modified telephone parts as receiving and sending apparatus. The feasibility of conducting a conversation through considerable depths of earth strata has been proven. Further experimentation is needed to determine the best methods of applying these principles to practical mine conditions and for the improvement of the apparatus for practical use in mine rescue and recovery work. The development of practical means of communication between miners entombed following mine fires and explosions and rescue parties on the surface would be of the greatest aid in the conduct of mine-rescue operations.

AT BRACEPETH COLLIERY, in County Durham, England, an explosion of the dust from crushed coal occurred on April 24, 1892, in a bin on the surface. Men, who were cleaning up, threw dust to the bottom of the bin onto four open lights. Six men were severely burned.



Underground Operation



Clouds of Smoke Made Without Flame Measure Low-Velocity Current

Anhydrous Tin Tetrachloride Now Used in Place of Fuming Sulphuric Acid to Make Smoke—Will Measure Ventilating Currents as Slow as Eighteen Feet per Minute

By H. W. Frevert, S. H. Katz and W. H. Carrick

SMOKE-TUBES have frequently been used by mining engineers and some details regarding the practice may be found in one of the publications of the U. S. Bureau of Mines.* These smoke-tubes consist of hermetically sealed glass tubes of about $\frac{1}{4}$ in. diameter and 5 in. long containing fuming sulphuric acid on

writers (W. H. Carrick) the smoke-tube and hand bulb were combined with a measuring stick and stop-watch to aid in determining the air velocities. Figs. 1 and 2 are side and front views of the smoke-stick employed in a coal mine. Fig. 3 shows the stick folded to go into its case, which also holds a separate hand

stick $\frac{1}{8}$ x $\frac{1}{4}$ in. in cross section, with hinges at the 1- and 2-ft. positions. At the latter position two hinges attach to a handle on which is a rubber bulb with inlet and outlet valves and a stop-watch. A lever is so fixed that pressure upon it with the thumb starts the split-second stop-watch and at the same time forces a puff of air through a small rubber tube leading to the smoke-tube. The smoke-tube is held in a spring clamp at one end of the stick. The puff of smoke from the tube discharges through a nozzle of hard rubber, in a direction at right angle to the smoke-stick. When the smoke has traveled the length of the stick, or other known distance (the center of the smoke body is taken as reference point) a second pressure on the lever stops the watch. The velocity of the air is calculated from the data noted.

Fuming sulphuric acid was used in the earlier tubes but anhydrous tin tetrachloride liquid is now preferred. The latter gives a dense smoke and while somewhat corrosive, it is much less so than the sulphuric acid, and there is less danger of damage to clothing, furniture or other materials with which the liquid might come in contact. The tin-tetrachloride smoke-tubes last for some time, as several hundred puffs of smoke are delivered before failure. A single tube suffices for a day's work or even more because the open ends of the tubes tend to seal over



Fig. 1—Using Smoke-Stick

To measure velocity of air in mine entry the smoke consists of the fumes of anhydrous tin tetrachloride. This method of measuring air velocities is well suited to mines where velocities are low and for tracing the action of air in dead ends of airways.

granular pumice stone. In practice, the tubes were broken open at the tips and attached to a rubber hand bulb by means of a rubber nipple. Pressure on the bulb forced air through the tube together with sulphuric vapors which form white clouds in the humid outer air. The clouds enable observers to determine the direction of air currents, to estimate velocities, and to detect leakage at stoppings and brattices. They have been used in mines or other places where it would be unsafe or not permissible to generate smoke clouds by fire.

At the suggestion of one of the

bulb with short rubber tube and a supply of smoke tubes. The case is carried by a shoulder-strap.

The smoke-stick consists of a yard

Fig. 2—Testing for Air Speed

The stick is a yard long and $\frac{1}{8}$ x $\frac{1}{4}$ in. in cross section and has hinges at the 1- and 2-ft. positions. With a stop watch the time of traveling the 3-ft. distance is measured, thus determining the speed of the air current.



*Katz, S. H., and Bloomfield, J. J., "Sulphur-Trioxide Smoke Tubes for Determining Air Currents": Bureau of Mines, Report of Investigations, Serial No. 2505, July 1923, 2 pp.

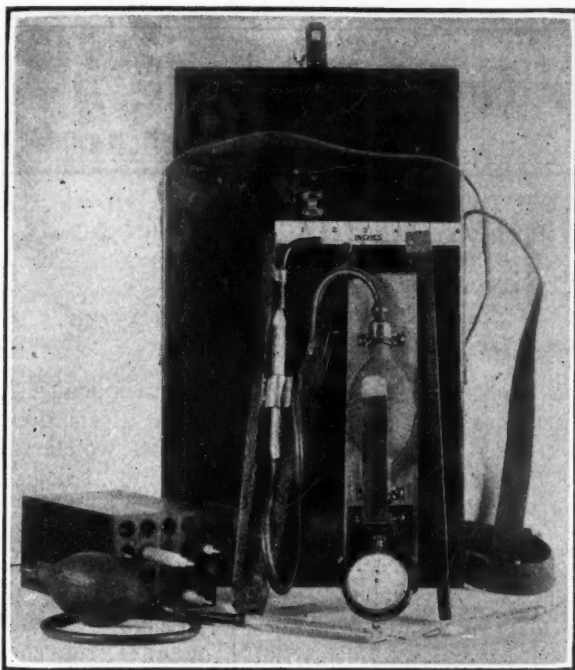


Fig. 3—Smoke-Stick, Folded to Go in Case with Accessories

The smoke-stick is 3-ft. long when extended. The accessories consist of two air tubes each with a tin-tetrachloride container, also a split-second stop watch. In the box is a nest for other containers, but a single one of them will give enough indications to meet the needs of a day's run.

with crystalline hydrated tin tetrachloride, and thus preserve the unused material.

In order to test the practicability of the smoke-stick, the air currents were mapped at forty-seven points in a coal mine having a bed of coal about 6 ft. thick. Each test with the smoke-stick at a point, whether near the floor, the roof, or midway between them was repeated three to five times to check results; as a rule the variations were less than 10 per cent. One-minute observations with an anemometer were made comparable to those of the smoke-stick, wherever the air velocity was sufficient to operate that instrument. Table I gives comparisons of the measurements by the two methods.

SMOKE-STICK FIGURES LARGER

The comparative tests with smoke-stick and anemometer show that the former generally gave higher velocity determinations than the latter. There were twelve higher as compared with seven lower; three determinations among the total of twenty-two gave the same results. The maximum discrepancy with the anemometer determination was 80 per cent, and the average discrepancy 22 per cent. Though this discrepancy is larger than desired, it may be partly due to the anemometer, for these instruments are not any too precise; but even if all the fault lies with the smoke-stick it still allows the latter

to be used when such errors are not larger than is permissible. The determinations with the smoke-stick required only a few seconds, whereas all anemometer determinations covered a full minute.

The anemometer ceased to operate when the velocity of the air was 60 ft. per minute, as indicated by the smoke-stick. The lowest velocity that the apparatus could measure with apparent accuracy was 18 ft. per minute because with any velocity smaller than that the smoke traveled in an indefinite direction and was dissipated. Observation was also difficult at the high rate of 200 ft. per minute because of the rapid

passage of the smoke over the 3-foot length. Two observers fifteen feet distant can determine these high velocities more accurately. However, the anemometer is well adapted for these determinations and requires only one observer.

With the smoke-stick, air circulation of definite directions and velocities was traced in a room in which coal was being mined. The room was 20 ft. wide and 120 ft. long, with a 50-ft. dead end beyond a crosscut to the next room. Air under forced circulation passed through 70 ft. of the room at an average velocity of 50 ft. per minute. In the dead end it moved toward the face along the floor at an average rate of 30 ft. per minute and returned near the roof at a rate of 23 ft. per minute, these results being the average obtained by experiments with the smoke-stick held at twenty-five positions.

DOWN TO 18 FT. A MINUTE

The conclusions may be summarized as follows:

Smoke-stick readings differed from those of the anemometer by an average of 22 per cent, of which 66 per cent of the indications were high. The maximum difference was 80 per cent, based on the anemometer. At velocities above 200 ft. per minute the anemometer functioned well, whereas determinations were not easily made with the smoke-stick because of the rapid passage of the smoke over the 3-ft. length. Below 60 ft. per minute the anemometer ceased to operate, whereas the smoke-stick was useful down to 18 ft. per minute. Below that velocity the smoke sometimes dissipated without definite direction.

The smoke-stick and accessories should prove useful for measurement of air currents of low velocity, 20 to 200 ft. per minute, in all classes of mines as well as in other places.

Would Dampen Shot Flames

A British chemical company proposes to put a charge of dry, powdered carbonate of magnesia in shot-holes. Where the shot is in danger of holing through into an earlier working, the carbonate is put behind the shot. Where the shot is an ordinary one and liable to blow its tamping, the dampening cartridge is placed in front of the explosive. According to the inventor the carbonate cartridge will cause a discharge of carbon dioxide, water vapor and incombustible powder that will put out flame before it leaves the shot hole.

Table I—Comparison of Mine Air Velocities Determined with an Anemometer and the Smoke-Stick

Spot No.	Height*	Air velocity, feet per minute			
		By Anemometer	By Smoke-stick	Difference	Percentage Difference Based on Anemometer
1	High.....	200	180	-20	-10
	Midway...	200	180	-20	-10
2	Midway...	205	180	-25	-12
4	Low.....	200	180	-20	-10
	Midway...	100	180	+80	+80
5	Midway...	180	180	00	00
6	Midway...	180	180	00	00
7	Low.....	110	120	+10	+9
	Midway...	110	120	+10	+9
	High.....	140	120	-20	-14
8	Midway...	120	120	00	00
15	Midway...	50	60	+10	+20
16	Midway...	120	90	-30	-25
17	Midway...	90	120	+30	+33
20	Midway...	80	72	-8	-10
40	Midway...	80	120	+40	+50
41	Midway...	50	72	+22	+44
42	Midway...	195	260	+65	+33
43	Midway...	150	180	+30	+20
44	Midway...	170	260	+90	+53
46	Midway...	200	260	+60	+30
47	Midway...	250	260	+10	+4

Summary of Discrepancies

	Number	Percent of Total Determinations	Maximum Percentage Difference	Average Percentage Difference
Negative errors	7	32	25	13
Positive errors	12	55	80	32
Zero errors	3	..	..	..
General average	22	..	..	22

*Height of roof above floor about 6 ft.

Viewpoints of Our Readers

Can Coal Be Used to Fertilize Land?

Owner of Small Mine in Delta County, Colorado,
Says Slack Made Alfalfa Grow for Him and Other
Agriculturists on Ground Heretofore Infertile

I WAS DETERMINED to make a fair test of fine coal slack as a fertilizer and chose for this purpose in our alfalfa field the sickliest looking, poisoned chico, or greasewood, spot I could find. I realized from the first that it would be a real contest, as these spots had resisted every effort we had made to reclaim them. Nothing would grow on the land chosen though alfalfa was thriving all around it. This spot was almost round and measured twenty-four steps in circumference.

I spread over it two common wagon loads of slack and spaded it under by hand last spring in as careful a manner as possible, mixing it thoroughly with the soil. When this was done I had a thin coat of manure spread over it. I was so interested in the result of this investigation that at first I would not trust to irrigation for sprouting the seed, which was alfalfa and oats, but watered it by hand with a sprinkler every morning and evening. The seed seemed a little slow to come up; but finally it began to peep through the ground, and the space was covered with a more beautiful green than I had almost dared to expect. When success seemed assured, I irrigated it regularly, trusting the care of it to no one else, and raised a crop of oats that was waist-high when headed out; the alfalfa can be seen near the ground growing in a healthy manner.

B. J. Ray of Delta told me he had been trying soil on different kinds of soil for several years, and that he found it beneficial on rocky, thin soil. He said it retains its effect for more than one year. He added, "I have been able to eliminate a greasewood spot with slack, manure and lime. I believe the slack played the biggest part in the improvement of the ground. The spot was 30 ft. wide and 50 ft. long where no stand of hay would grow. The lime and manure were applied first, and next year I began to put on the cleanings from our coal bin. Each year as slack was applied the spot became smaller until now it has entirely disappeared." Mr. Ray said his attention was first directed to the use of slack by an article he saw in the *Delta Independent* about four years ago, quoting from some other paper the opinion of an agricultural college professor that screenings were beneficial to soil, the

unsalable supply of which was practically inexhaustible.

E. Nutter, said the soot from the pipe of a coal stove had been used for fertilizing roses with wonderful results. Their colors were intensified and they did not fade so quickly as when the soot was not applied.

W. A. Wolf told me that his neighbor, N. Beluchi, hauled manure from cars bedded with slack, and that he put it on sugar-beet land. The results were so apparent that it became a general matter for discussion. R. E. Collins, who prospected for coal for several

years, claims that he could trace the bed for miles by the lustier growth of cedar and pinon trees at the outcrops.

CHARLES G. STATES,
States Hall Coal Co.

Cedar Edge, Colo.

New Types of Railroad Grates May Open Wider Market for Screenings

The transactions of the 18th Annual Convention of the International Railway Fuel Convention, held in Chicago in May, 1926, contain some interesting data relative to locomotive grates and the percentage of grate area necessary for the admission of air. Heretofore the average locomotive grate has maintained an air opening totaling approximately 40 per cent, and for years this basis was regarded as being about right for coal of varying character, used in varying service.

In the past three years a new theory regarding air openings in grates has arisen, the Santa Fe R.R. people developing the fact that a smaller air-opening and air-admission area was productive of improved results where certain coals were used. The Northern Pacific R.R. also undertook experimentation with a new type of table grate with an air-opening area of approximately 12 per cent. In its attempts to burn Montana lignite coal carrying 25.66 per cent of water, with a thermal efficiency of but 8,743 B.t.u. per pound, it found that the new type of grate was a success, not only when lignite was burned, but also when coals from Roslyn, Wash., Red Lodge, Mont., and the eastern Lake docks were used.

The theory of the reduced air area obtained by using a conical-shaped hole with the smaller opening of 1-in.



Oats Grow on Barren Ground After Coal Is Spaded In

A piece of ground that on which only poisoned chico, or greasewood, would grow is made fertile by the use of slack, lime and manure. Coal has possibly plant ingredients, other perhaps than carbon, that are assimilable. When the ground is heavy, and impervious to moisture it may lighten it. When it is alkali it may render it neutral. Will it help everywhere? And how does it help?

diameter at the surface of the grate, is that of securing a more complete diffusion of the air, admitted with no single opening sufficiently large to admit of an entering blast of air that would lift the fuel bed out of place, a common defect of the old type of grate. The result is that a thin bed of fire can be maintained at all times, and when the engine is in service particularly where fine sizes are used, a portion of the coal is burned in suspension just above the grate line, in the mixture of air necessary for complete combustion.

In addition to the Santa Fe and Northern Pacific Railroads, several other companies are undertaking tests of grates similarly constructed, with the view of burning the smaller sizes of coal that are frequently sold at relatively low prices. The reduced air opening likewise reduces spark and ash-pan losses and an increased efficiency equal to from 5 to 7 per cent, per unit of service, is reported. The general adoption of this type of grate would tend to equalize the price charged for screenings and mine-run coal, influencing likewise the prices charged for domestic sizes of bituminous coal. The field is one worthy of the attention of both railroad men and coal salesmen.

EUGENE MCAULIFFE,
President, Union Pacific Coal Co.

Omaha, Neb.

Hamlet of the Coal Mines

[Enter Old Hamlet—With Pick and Shovel on his Shoulder, Looking Gloomy]

The time is out of joint! No artisan
In all the world can set it right.
How weary, stale, flat and unprofitable
Seem to me all the uses of these strikes.
The wormy fruit are they of too much ease
And show no reasons why they should occur.

To strike or not to strike—that is the question:
Whether 'tis nobler that a man should slave
And let the greedy bosses work their will
Or to throw down our picks, defy our masters,
And by opposing strike the common enemy
Of all—much work and little pay. To strike
To end all striking—'tis a consummation
Devoutly to be wished.

But here's the rub:
We all are branded with old Adam's curse—
'Though each is trying to escape the doom
Which forces us to eat our bread
In sweat of face until the end of time.
For who would groan under a heavy load
If he could shift that burden from his back
And deftly cast it 'bout his brother's neck?
Or who would toil in confines, dungeons vile,
For bare existence if he could soldier
In slippered ease, with belly full
On couch of down?

All fight for ease, and man,
That paragon of animals, nobly
Dower'd in many ways, yet calls his sloth,
Not laziness, but pride, and so becomes
Expert in dodging work and makes his skill
In dodging proof of his success, his badge
Of victory.

Alas! to what base ends
Do great men bring their greatness. I have served
The primal sentence groaning years and seen
Vast armies, leaders and instructors too,
Debate eternities concerning straws,

And, puffed with kindly ardor, legislate;
Ay, passing laws to make it easier
For me to wield this shovel and this pick.
And so they make their mimic show of help,
For all their motions, bills and statutes quaint
Do not relieve my troubles in the least.
Myself, I am indifferent honest:
Were all like me, bad as things are, they would
Become far worse. Strikes would be ended, peace
Would be restored, motion would cease, there would
Be nothing more.

To what tribunal then
Is't wise to bring my case? To arbitrate
When judges all have business of their own
To sway their minds and color judgment? No!
Forsooth, I'm still left swinging pick and spade
In spite of all their learning and their laws.
The more I think, the more bedazed I wonder
What wickedness it is which makes us blunder.
For wickedness or madness, not a dark
Stupidity brings on disasters keen
Like hungry strikes for ev'ry man knows well
The difference 'twixt a hand-saw and hawk. Yet,
We're built of such contrary parts that some
Would vote and swear a hand-saw was a hawk.
But as for me, a shovel's not a hawk—
I learned that from an ancient, aching back.
Adieu—here comes the wonder-work of all,
The masterpiece of man—a motor car!
[Exit]
JOHN MCNEILL.
North Minto, N. B.

Wilson not Contemplating Mine Operation

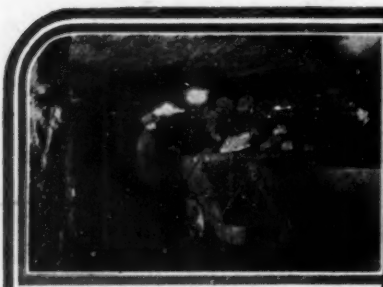
On July 8, *Coal Age* published a small item stating that William B. Wilson, Democratic candidate for U. S. Senator in Pennsylvania, had leased a non-union coal mine in Chesterfield County, Virginia. I wrote Mr. Wilson and received the following reply:

"Daniel Milsom of Allport, Pa., who is my brother-in-law, operated a small mine in Pennsylvania for many years on a union basis. Two or three years ago the mine was exhausted and he began looking around for another small property. He learned of a 90-acre tract in the Richmond coal basin. When he went down to look it over, last December, before making a lease I went with him to give him the benefit of my judgment relative to its value. That may have given rise to the statements recently carried in the Richmond papers and *Coal Age* that I was interested in the lease.

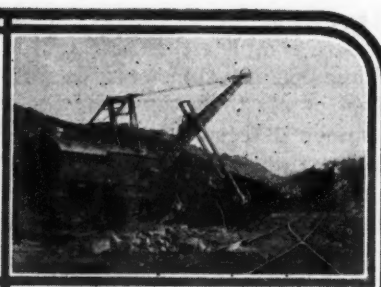
The property was not in operation at the time Mr. Milsom acquired the lease and has not been operated since. The development of the Richmond coal basin has been so small that the United Mine Workers of America has not, as yet, attempted to make a wage scale for it but I have no doubt from Mr. Milsom's past record that whenever the union decides to negotiate a scale for that field he will not be found antagonistic to the union."

LEWIS S. GANNET,
The Nation, New York City. Associate Editor.

Measurement of the heat required to carbonize various types of coal at relatively low temperatures (1,100 deg. F.) under specified conditions have shown the heat to be 7 B.t.u. per pound for coal from the Pittsburgh seam, 37 B.t.u. for Utah non-coking coal and 81 B.t.u. for Denver lignite, according to Burke and Perry in a paper prepared for the American Chemical Society.



News Of the Industry



British Strike Parleys End in Row Over Hours of Labor; More Miners Quit Union to Return to Coal Pits

Fresh hopes of an early settlement of the British coal strike, now nearing the end of its fourth month, were smashed last Thursday when mine owners and union leaders, after a short conference called at the request of the British Miners' Federation, split again over the question of hours. Coal owners insisted upon an eight-hour day and district agreements. Labor chiefs insisted as stubbornly upon retaining the seven-hour day and a national agreement.

Following the collapse of the negotiations, more miners showed dissatisfaction with prolongation of the strike. At a meeting held the evening of the same day the conference ended, delegates from the workmen of the Bolsover Colliery Co. accepted a proposal to return to work at the old wages for a seven and one-half hour day. The acceptance involved several thousand men. Nottingham and Derbyshire coal owners then announced that they were ready to re-open under the same terms. On Monday of this week, approximately 18,000 had returned to work in the Midlands, despite more aggressive picketing.

So serious has the situation become from the Federation's standpoint that strike leaders spent the week-end in a speech-making campaign to hold their ranks and bolster up their waning leadership. Although union spokesmen bitterly denounce the owners for the attitude displayed in the conference of Aug. 19, recent actions indicate that "Emperor" A. J. Cook, secretary of the Federation and his associates are growing increasingly concerned over the maintenance of their leadership.

Miners Want Peace?

The decision to ask the coal owners for a conference came at the end of a two-day meeting of delegates of the Miners' Federation in London and only after Mr. Cook had begged the delegates not to tie their executives' hands with detailed instructions as to how negotiations should be conducted. In spite of the "Emperor's" pleas for unlimited authority in negotiations, the delegates demanded that negotiations with the coal owners should be considered only in the terms of a national agreement.

After the collapse of the negotiations called under this authorization, Mr. Cook said:

"It is evident from the coal owners' statement that they consider themselves victors in this struggle; that during the progress of the stoppage they have learned nothing and forgotten nothing; that the only way, in their opinion, that the country can be supplied with coal is by the direct surrender of the men to the original terms laid down by the coal owners.

"We have no alternative, therefore except to urge upon all our members the necessity of stiffening their resistance to these terms, which, if accepted, would mean abject poverty for our people and a scandalous lowering of their standard of living for at least a generation.

"We again appeal to the public of this country for their continued support in aid of the miners and their wives and children. No further negotiations with the coal owners are possible."

Government in Background

The resolution under which the Federation executives acted also authorized parleys with the government. The government, however, has remained discreetly in the background. Premier Baldwin was in London the day the negotiations were on with the employers, but later it was stated that he

Mexico Nationalizes Coal

The Mexican government has published regulations which declare all coal deposits the property of the nation and not of the landholder. This interpretation of the law means that the government has supervision over many details of the mining industry south of the Rio Grande in which hundreds of millions in American dollars have been invested. The government had previously enacted a law nationalizing petroleum, but the latest regulations bring all commercially valuable minerals and precious stones within the scope of federal control and ownership. The law prescribes the provisions under which the government may grant and revoke mining concessions.

would go to Aix-les-Bains, France, for a rest.

Winston Churchill, Chancellor of the Exchequer, speaking at Swansea on the eve of the unsuccessful parleys, criticized both operators and miners for not settling their difficulties during the period the government subsidy was in effect. He made it plain, however, that "whatever happens there can be no more subsidy. On that we are determined. We will not accept the position that one industry is to quarter itself indefinitely upon the public exchequer at the cost of the whole mass of the people."



A 4 M.P. (Man-Power) Hoist in the Staffordshire Field, England

Mine No. 86 at Cheadle where the miners are opening a shallow field of coal adjacent to the outcrop. Gangs of men have their pits staked out and numbered. The mining resembles a miniature Klondike, a thousand men working on one outcrop.

Differences in Mining Conditions In United States and Great Britain Not So Great, Assert Coal Experts

By Paul Wooton

Washington Correspondent of Coal Age

Among the more interesting discussions at the Williamstown Institute of Politics, in the opinion of some of those in attendance from Washington, was that pertaining to the future of the British coal trade. The Washington group was much impressed with the view of Charles Camsell, of the Canadian Department of Mines, that the adjustments necessary will be made to enable Great Britain to retain its place in the coal markets of the world.

Marked interest was shown in a comparison of physical conditions of the coal mines of the United Kingdom and those of the United States. This discussion was based upon the report of the British Royal Commission and upon a forthcoming bulletin of the Bureau of Mines dealing with physical conditions in American coal mines by M. H. Schoenfeld and F. G. Tryon. This is the first time that quantitative data on such physical facts as depths of mines and thickness of seams have been assembled either for the United Kingdom or the United States. One of the striking features of the comparison is that the differences in conditions of mining in the two countries are not so great as is generally supposed.

False Impressions Prevail

A wrong impression has been created in both countries, it was brought out at Williamstown. In most instances when an American coal man visits the British mines he is interested most in the striking features of conditions. He wants to see deep workings and thin coal. These extremes leave a deep impression and cause the visitor to lose sight of the fact that a large number of the British mines are working thick coal and that a considerable portion of the output comes from veins not far from the surface. In like fashion when the British owner comes to the United States he wants to see the famous beds. The fact is not impressed upon him that the seams now worked in central Pennsylvania, Alabama, and in the Southwestern Interstate Field are relatively thin.

The difference in average thickness in the two countries is not great. In

the bituminous fields of the United States the average thickness mined, that is the net thickness exclusive of partings and coal left in roof and floor, is 63 in. In the United Kingdom the average is 50 in. Considerable thick coal still is being worked in the British Isles as 27 per cent of the output comes from seams that measure over 5 ft. On the other hand 25 per cent of the American soft coal production comes from seams less than 4 ft. thick.

There are districts in the United States, it was shown, where the average thickness is less than 2 ft. In Osage County, Kansas, a 21-in. seam is mined with an output of 1.3 long tons per day per man underground. This is higher than the average for the United Kingdom, where per capita production is 1.12 long tons in the present 7-hour day. The Osage seam, however, is near the surface and the production is small, but there are American districts which are large producers from thin seams. Iowa, for instance, has an average thickness of 46 in. This is close to the average in Durham and is considerably less than that in South Yorkshire, where the average is 57 in.

The outstanding difference between conditions in the two countries is depth and not the thickness of beds. Judged from American standards the British work under difficulties which appear great. We have had little experience in handling heavy pressures, but for the British this is a normal condition. In this country the average depth of all shaft mines is 262 feet. It is exceptional when tunnel propositions have 500 feet of overburden.

Average Depth Greater

In the United Kingdom the average depth of shaft mines is 1,023 feet. In some districts the average is greater. In South Wales the average depth is 1,089 feet. In South Yorkshire the average is 1,509 feet. The Royal Commission's figures show that more than one-half of the British output is won from depths in excess of 900 feet. In the United States only 0.3 per cent of the output comes from below that depth.

Because of the depth of British workings it is the practice to develop relatively larger mines so as to justify the large investment in the shaft. In the United States 49 per cent of the production is from mines with an annual output of 200,000 tons or more. In the United Kingdom 67 per cent comes from mines in that class. In South Yorkshire 95 per cent of the production comes from the large mines.

The large mine usually has a long life. That fact, coupled with the slow rate of growth of the British industry, means that most of the tonnage comes from mines which were laid out years ago. According to the Royal Commis-

Work Begun on Building With Walls of Coal

Down at Middlesboro, Ky., near the junction of Kentucky, West Virginia and Tennessee, in the southeastern Kentucky coal fields, the cornerstone of a new Chamber of Commerce Building has been laid, the walls of this building to be constructed from coal donated by the operators of the city, while firms and individuals have donated the material, and carpenters and other workmen the necessary service in construction.

So far as is known this will be the first building in the state to be erected of coal, and it will be a lasting and interesting exhibit for the coal trade, which is the principal industry in the Middlesboro, Pineville, Harlan, Hazard and Pikeville sections.

sion 70 per cent of the miners work in mines thirty years old or older. In the United States one-half of the men are employed in mines opened within fifteen years.

This one fact of age in Great Britain and youth in the United States is significant, not only because of longer hauls and the time consumed between the pit bottom and the face, but because the old mine is handicapped by a certain amount of antiquated equipment and by antiquated customs. British miners soon become set in their ways. Once customs are established in a given pit, they are hard to change. A new mine starts with a clean slate and can plan a layout which will allow the use of the latest technical improvements.

Manufacturing Profits Drop Though Business Gains

Despite the abounding prosperity of many individual business concerns, indications are that less of the consumer's dollar is going into manufacturing profit now than at any time since the war, with the exception of 1921, according to a study of manufacturing incomes made by the National Industrial Conference Board.

While in 1919 9.28c. out of every dollar of the manufacturer's gross receipts represented net income, his net income amounted to only 6.35c. per dollar of gross receipts in 1923, the latest year for which comprehensive income statistics are available. Out of that, moreover, he had to pay income and profit taxes. Although increased manufacturing efficiency may have increased the net income somewhat since that time, higher wages and a practically stable price level combined have not left much leeway to the manufacturer to increase his margin of profit during the last two years, according to the Board. The figures cited represent the total net income of all manufacturing corporations combined, taking into account those operating profitably as well as those operating at a loss.

EDITOR'S NOTE—The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and COAL AGE editorial policy; neither do they necessarily represent Mr. Wooton's personal views. It is felt that the opinions thus faithfully reflected will be of great interest to the industry. Where opinions are cited from sources outside of the government, the source will be specifically stated.

Union Balks Ohio Plan For a Joint Conference To Revise Wage Rates

Plans of the newly organized Ohio Coal Operators' Association to meet with the Ohio district union in a joint wage parley were smashed last week when Lee Hall, president of District No. 6 of the United Mine Workers, told the producers that the Ohio district would consider no revision of the existing agreement not contemplated by the terms of the Jacksonville contract.

The invitation to the union was extended to Mr. Hall by a resolution adopted by the board of directors of the Ohio Coal Operators' Association at a meeting held in Columbus, Ohio, on Aug. 10. At that time, the producers represented emphasized their desire to continue friendly relations with organized labor, but also made it clear that they thought it extremely unwise to go along further as a part of the Central Competitive Field.

Mr. Hall's declination was considered at a meeting of forty-five members of the operators' organization at the Neil House, Columbus on Aug. 24. S. H. Robbins, president of the association, called for a report of the scale committee which met in Cleveland last week. After a recess, it was announced that the committee report, recommending a scale closely following the 1917 rates would be taken up at a session later in the day.

Discussion at the morning meeting made it plain that the operators' association will itself take no steps to re-open any mines now closed. The question of working out the new scale is to be left to the individual members.

The text of the Hall letter read:

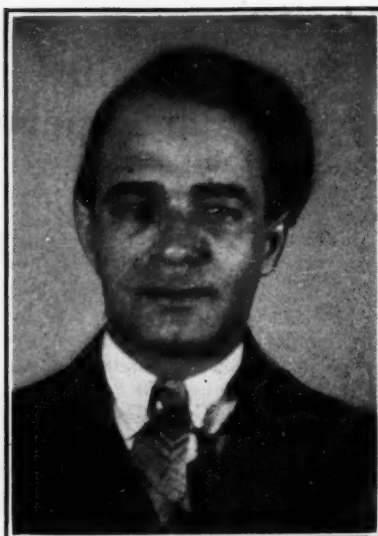
"I have your communication of Aug. 10 in which your association has requested me, as president of District No. 6 of the United Mine Workers of America to call a meeting of mine workers of the state to meet in joint conference with the operators of Ohio for the purpose of considering a wage scale.

"The mine workers of Ohio are now under contract with the coal operators of Ohio, who compose the membership of your association and other operators in the state. The present contract, to which you gentlemen are a party, does not expire until March 31, 1927. The contract above referred to bears the signatures of S. H. Robbins and T. R. Biddle, two members of the board of directors of your new association. These gentlemen were selected as members of the sub-committee to represent the Ohio operators at the joint scale conference of the Central Competitive Field, which was held in Jacksonville, Fla., in February of 1924.

"This contract was made for a period of three years.

"The Jacksonville agreement above referred to makes provision for the calling of another joint conference. Sect. 2 reads as follows:

That an interstate joint conference of the Central Competitive Field shall assemble the second Monday in February, 1927, at Miami, Florida, and the president of the United Mine Workers of America and the chairman of this joint interstate



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Rinaldo Cappellini

President of District 1, United Mine Workers, who is being kept very busy these days trying to adjust differences which are leading to strikes in the northern field. Last week men at the Taylor colliery of the Glen Alden Coal Co. walked out and the Nottingham colliery and Washington mine of the Lehigh & Wilkes-Barre Coal Co. were closed down because of the attitude of the company men employed.

conference are authorized and instructed to send out notices at the proper times as to the assembling of the conference.

"Therefore, under the provisions of the contract above referred to as president of District No. 6 of the United Mine Workers' of America, being a party to the Jacksonville agreement, I can not comply with your request in calling the conference, referred to in your communication."

Lewis to Speak at Labor Day Celebration in Philadelphia

A labor demonstration sponsored by the American Federation of Labor will be a feature at the Sesquicentennial Exposition at Philadelphia on Labor Day, Sept. 6.

William Green, president of the American Federation of Labor, and John L. Lewis, president of the United Mine Workers, will be the principal speakers. A large delegation of trade unions from various parts of the country will parade the exposition grounds, headed by Matthew Woll, vice-president of the A. F. of L., and Major George L. Berry, president of the International Printing Pressmen and Assistants Union.

Sales of Explosives Higher

Reports of manufacturers of explosives to the U. S. Bureau of Mines show that sales of explosives in June, 1926, excluding exports, amounted to 405,549 kegs of 25 lb. each of black blasting powder, 5,315,362 lb. of permissible explosives, and 27,325,169 lb. of high explosives other than permissibles. As compared with June sales last year, the figures indicate a decline of 12 per cent in the volume of sales of black powder, and increase of 6 per cent for permissibles, and an increase of 7 per cent for high explosives other than permissibles.

Midwest Foresees Trouble When New Scale Comes Up

Operators in Illinois and Indiana are not particularly optimistic that the United Mine Workers will accept a reduction in wages when negotiations on a new scale begin next spring. A long drawn out suspension of mining is generally predicted, with John L. Lewis, president of the miners, ultimately recognizing the necessity for an adjustment by agreeing to certain modifications of working conditions in the new contract.

The chief fight will be in mechanization of the mines, it is believed. The operators will at first demand a reduction in wages. Following a deadlock over the issue suggestions are expected to be made for the greater use and development of machinery in the mines to take the place of some of the workers in loading and other tasks of production. The use of machines has increased in Illinois during the last year but their development has been obstructed by union restrictions.

Machines, it is declared, will cut production costs 25 to 30 per cent, or the equivalent to the 1917 wage scale, under which most of the mines in the non-union territory are now operating. The reduction, however, will be realized only in the event that the union abandons its policy of restrictions, and it is this that the operators are expected to press for.

Operating officials in Chicago are not disposed to speak officially, preferring to await developments. They refuse to be quoted but privately declare that trouble is almost certain. While old customers are not being advised to store coal as yet there is a disposition on the part of shippers to point out the advantages of doing so toward the end of the year.

Sneed to Oppose Farrington For Illinois Presidency

A warm contest for leadership of the Illinois mine workers union at the December election became a certainty with the announcement of the candidacy of William J. Sneed, of Herrin, for the presidency. Frank Farrington, the present incumbent, said he will be a candidate for re-election, although he has made no formal announcement of his candidacy. At present he is in Europe as one of the two delegates from the United States to the meeting of the British Trades Union Congress.

Sneed is now an executive board member from the Tenth Illinois sub-district of the miners, and for the last six years has served in the State Legislature as Senator from the Fiftieth district. His supporters claim a formidable following, pointing out that he comes from the southern Illinois region, where the balance of power is vested. He was president of the Williamson County miners in 1918.

The fall meeting of the American Welding Society will be held in Buffalo on Nov. 17, 18 and 19. An international welding and cutting exposition will be an important feature.

West Virginia Safety Day Contest Brings Out 122 Teams; First Places Won by Island Creek Coal Teams

By J. H. Edwards

Associate Editor Coal Age

With 122 teams competing, the West Virginia State Safety Day held at Huntington, Aug. 21 was one of the largest events of its kind ever held in the United States. First honors went to the team from No. 8 mine of the Island Creek Coal Co. at Holden. They were presented with a 31-in. cup to be kept as a permanent souvenir of the victory. In addition each of the six men comprising the team received a 12-in. cup. Clarence Riggs was captain of the team; his associates were: David J. Lawson, Lilburn Riggs, James G. Cyrus, C. R. Mullens, and J. H. Collins.

After a parade of safety teams and floats through the streets of Huntington the crowds entrained to Camden Park and by noon the celebration was in full swing. First on the program was the governor's luncheon for officials and speakers. This was followed by a series of short speeches from the band stand. W. H. Cunningham, secretary of the West Virginia Coal Operators Association presided. The speakers were Dr. W. E. Neal, mayor of Huntington, V. E. Sullivan, state mine inspector and president West Virginia Mine Inspectors' Association, Morgantown, Governor M. Gore, and Harry L. Gandy, executive secretary of the National Coal Association.

Three Problems Face Teams

Three problems were given in the general contest. A tie of several teams for first place required a separate run-

off for those teams. The Island Creek Coal Co. also took second place with a team from its No. 11 mine. Third place was taken by the Slagle team of the Logan County Coal Corporation. Other teams receiving honorable mention and prizes from industrial firms were the Benwood team of the Hitchman Coal & Coke Co. fourth prize; and a team under the guidance of C. A. McDowell of the Davis Coal & Coke Co., for coming the greatest distance.

Demonstrates Rock Dust

Following the first aid contest J. W. Paul of the U. S. Bureau of Mines demonstrated the protection that a 65 per cent mixture of rock dust gives to a coal mine. A black-powder blown-out shot fired into a wooden gallery loaded with the mixture which was thrown into suspension by concussion of the cannon showed no signs of igniting the dust. The gallery was 84 ft. long, 7 ft. wide and 6 ft. high. Later a similar test was made with coal dust alone. This time the blown-out shot ignited the dust and caused a spectacular explosion, in which gallery was practically wrecked.

Announcement of the winning teams was held up until the banquet in the evening. Somewhat over 1,200 seats were provided in the festive hall but this failed to accommodate those who turned out. H. A. Zeller of the West Virginia Rail Co. acted as toastmaster. The speakers were Major Henry Alshire, president of the Huntington Chamber of Commerce, Colonel R. E. O'Conner, superintendent, Department of Public Safety, Harry L. Gandy, W. H. Cunningham, Congressman Frank C. Bowman, Ex-Governor Hatfield, and Lee Ott, state commissioner of compensation.

Chief Robert M. Lambie of the State Department of Mines was treated to a happy surprise at the banquet. He was presented with a beautiful loving cup 21 in. in height and inscribed as follows: "State Mining Industry, Presented to Robert M. Lambie, Chief Department of Mines, As a Slight Recognition of His Untiring Labors in the Furtherance of Safety in the above Industry, Huntington, W. Va., 21st Aug., 1926."

Speakers at the banquet expressed the hope that next legislature would see fit to appropriate money for making Safety Day a regular annual event in the state. This First Annual Safety Day was financed entirely by voluntary subscriptions by the coal operators and by companies which sell mining equipment and supplies in West Virginia.

In addition to Robert M. Lambie and his inspectors, much credit for the success of the meet is due J. H. Forbes of the Federal Bureau of Mines, Huntington, and Thorne V. Smith of the firm of Smith & Barnett, engineers of the same city.

University to Teach

Accident Prevention

In an effort to check the rising tide of industrial and public accidents and in response to the demand from all parts of the country for trained leaders in safety work, New York University, with the cooperation of the American Museum of Safety, will offer next month the first collegiate course in accident prevention. Mr. Williams, President of the American Museum of Safety, declares this decision of New York University to train men and women for leadership in accident prevention work is one of the most significant developments since the beginning of the safety movement. The course will be given under the direction of C. W. Price, vice-president of the Elliott Service Co., formerly general manager of the National Safety Council and director of safety in the International Harvester Company.

California Entries Heavy in International Rescue Meet

Eighteen California mining and oil company first-aid and mine-rescue teams will compete in the International Mine Rescue and First Aid Meet at San Francisco Aug. 29 to Sept. 4, under the auspices of the U. S. Bureau of Mines. California will have the largest number of entries of any state. A special trophy for the best California team has been offered by the Society of Safety Engineers of California and the American Red Cross has offered special medals for individual members of winning teams.

The arrangements in California are being handled by the Society of Safety Engineers of California, of which Byron C. Pickard, of the Berkeley experimental station of the Bureau of Mines, is president. The Bureau of Mines will have twenty-eight engineers at the meet, as well as one of its mine-rescue cars.

All Section Represented

Arizona will send five teams and Montana two. Practically every other mining and oil state will be represented, including several from Oklahoma, Texas, Illinois, Pennsylvania, New Mexico, West Virginia, Kentucky, Ohio, New York, Wyoming, Colorado, Nebraska, Tennessee and North Carolina.

The Southern Coal, Coke & Mining Co. team from Illinois, present champions, will try to hold the honors won by them last year at Pittsburgh.

Among the co-operating agencies for the meet are the University of California College of Mining, Arizona Mine Owners, Arizona Chapter of the American Mining Congress, Mining and Metal Producers' Association of California, California Petroleum Producers, San Francisco Chapter, American Institute Mining and Metallurgical Engineers, Standard Oil Co., Union Oil Co., Shell Oil Co. and mining, oil, cement, railway, public utility and powder companies.



A Tribute to Lambie

The winning teams in the West Virginia State Safety Day contests were not the only ones to carry off cups. At the banquet that ended the celebration, Robert M. Lambie, chief of the Department of Mines, received the cup shown above as a mark of the industry's appreciation of "his untiring labors in the furtherance of safety."

Lewis Attacks Report On Western Coal Rates As Blow at Mine Union

A tentative opinion of the Interstate Commerce Commission, written by Examiner William A. Disque, recommending the dismissal of the complaint of Illinois and Indiana operators against the relative adjustment of rates to the Chicago switching district and to Western and Northwestern destinations was bitterly assailed by John L. Lewis, international president of the United Mine Workers, this week in a letter to the Commission.

Mr. Lewis' wrath was aroused by the statement of the examiner that the disparity in wage rates between union and non-union fields and not transportation charges was the root of the troubles now afflicting Illinois and Indiana producers.

The complaints of Illinois and Indiana operators, taken collectively, allege that the rates are prejudicial as compared with those from mines in western Kentucky and in the so-called inner and outer crescents in Pennsylvania, Maryland, Virginia, West Virginia, eastern Kentucky and Tennessee. The case centers largely around the 25c. differential between the southern Illinois and western Kentucky groups, but the Indiana mines also seek increased differentials between the Indiana and western Kentucky groups.

Wants Findings Reversed

Mr. Lewis asserted that the Disque report was "an amazing and gratuitous attack upon the wage schedules and living standards of the mine workers employed in the industry" in Illinois and Indiana, and urged a reversal of the findings of the examiner.

"I have never understood it to be any part of the functions of the Interstate Commerce Commission," Mr. Lewis said, "to attempt to batter down the wages of those who labor. Neither have I understood it to be the function of the commission to permit its decisions and rulings on rate questions to be made the vehicle by either party to an industrial wage controversy, as has been done in this precise instance."

Mr. Lewis pointed out that existing rates were those fixed by the United States Bituminous Coal Commission in 1920 and asserted it was "extraordinary, indeed, that an official representative of the Interstate Commerce Commission would now, as in this instance, openly denounce the wage scale that was formulated and handed to the industry by another government agency."

The alleged maladjustment of the coal rate structure was said by Mr. Lewis to have arisen largely from the fact that since 1915 the rates from the Indiana mines to every principal market "have been increased out of all proportion to the rate increases from the mines in other states."

Arrangements are being made for navy co-operation in the work which the Bureau of Mines is doing on the burning of pulverized coal in marine boilers.



British Mine Owners Aim Shafts at "Emperor" Cook

A periodical called *The Coal Strike Times*, issued by the operators, devotes much space to cartoons like the above, reprinted from the *London Evening News*.

Convicts in Missouri Mine Cause Strike Threat

Leasing of the South mine of the Western Coal & Mining Co., at Lexington, Mo., to the State of Missouri, and the importation of 65 convicts by the prison board at Jefferson City, to operate the mine, is arousing Missouri miners in protest, and a strike is threatened. The closing of the mine by the Western Coal & Mining Co. is said to have thrown 134 miners out of work, although the company announces that it will shortly open another mine which will employ about 200 men.

Arch Helm, Moberly, Mo., president of District No. 25, United Mine Workers, declared that the leasing of the mine was in violation of the miners' contract with the company. "The market for miners in Lexington already is flooded," Mr. Helm said. "Of the 800 miners living in Lexington, 300 now are out of employment, and those remaining are working only part time."

Helm also stated that the employment of convicts in the mine is forbidden by state laws, which prohibit coal mining by untrained men unless they are accompanied by trained men in the mines.

George J. L. Wulff, president of the Western Coal & Mining Co., St. Louis, Mo., also is president of the Southwestern Coal Operators' Association, Kansas City.

W. B. McGregor, member of the penal board, who has charge of the operation of the mine and other convict industries outside the prison, announces that the first shipment of coal from the recently leased mine in Lexington has been made to the state reformatory in Boonville. When asked for comment, he said the operation of the mine by the prison would continue. He denied, however, that convicts would be used in the mine in competition with free labor. He said that the coal would be used only in the various penal institutions, the lease expressly providing that none of the coal is to be sold for commercial use.

Merger Rumors Rouse Wrath Of Officials Affected

Consolidation rumors drew the ire of several coal companies in Chicago last week. Reports that certain operating concerns were involved in contemplated mergers brought hot denials because of the loose and free use of the names of the companies.

Three concerns made it plain that they were in no scheme of consolidation unless the purchase of the properties was outright and for cash and at the price they named. Officials declared their mines have been and are for sale providing they can obtain what they ask. By way of emphasis one said he would sell anything he had except his wife and family if the price was right.

Rumors of the companies joining the reported consolidations weakened the morale in the concerns, it was asserted. Therefore a few stepped out to squelch the spread of the reports, which appeared to hinge around the \$50,000,000 merger contemplated by W. A. Brewerton, president of the Brewerton Coal Co. This deal, which was supposed to take in about fifty properties in Illinois and Indiana, remains in the *status quo* of the first announcements on the reported consolidation about six weeks ago.

Will Not Discuss Plans

E. D. Logsdon, president of the Knox Consolidated Coal Co., of Indianapolis, the latest figure in alleged mergers, announced that there is nothing to be said at this time about his plan, which is declared to take in approximately 100 mines in Indiana involving close to \$100,000,000.

It is reported that the National City Bank of New York is interested in Mr. Logsdon's venture and that Mr. Brewerton has been dickering with the Chase National Bank of New York in his undertaking.

J. D. Zook, vice-president and general manager of the O'Gara Coal Co., Chicago, led the attack against the promiscuous use of company names in the alleged consolidations.

"Reports have recently been circulated widely of proposed consolidations of coal companies and frequently the name of O'Gara Coal Co. has been included among the companies mentioned," said Mr. Zook. "The persistence with which these reports have been made makes it seem advisable to announce that the O'Gara Coal Co. is not a party to any plan looking toward the consolidation of its properties with those of any other coal companies. The ownership and management of the O'Gara Coal Co., as a single company continues independent of any consolidation."

Officials of the J. K. Dering Coal Co. and the Miami Coal Co. voiced practically the same sentiment.

An electric blower is being set up on the fresh air side of a stopping in a commercial car mine by the Bureau of Mines, with the idea of blowing a small but continuous stream of rock dust into the return air current to determine if this method of distributing dust can be used successfully in trackless entries.



News Items From Field and Trade



ALABAMA

Alabama Mineral Land Co. Sells.—The stock of this company has been purchased in its entirety by Birmingham capitalists. Erskine Ramsay has been made chairman of the board, J. W. Oden becomes president, Andrew C. Ramsay, first vice-president and treasurer, and J. R. Oden, second vice-president. The company holds 150,000 acres of mineral lands in fee and 175,000 acres in mineral right only. The fee tracts contain a large quantity of timber, and the lands owned include parts of the properties now being worked by the Bessemer Coal, Iron & Land Co., the Roden coal and Walter Henly coal interests and the Hills Creek coal mines. The acreage is in the Blockton field. It is possible, though no plans have yet been made, that mines will be opened by the Alabama Mineral Land Co. later.

The DeBardeleben Coal Corporation has moved its general offices from the First National Bank Building to the Southern Railway Building, Twenty-second Street and First Avenue, North, it occupies the entire tenth floor.

COLORADO

Contracts are about to be let for the construction of 21 new houses at the new Barber Coal Co. mine north of Alamo and two and one-half miles from the Big Four mine. The branch railroad to the mine has been completed, the tippie has been raised, and all of the outside buildings have been constructed. About fifty men are now employed, but a desire for increased production will require additions in the near future.

ILLINOIS

Mulberry Hill Mine Working.—The Mulberry Hill mine, near Freeburg, has resumed operations after having been idle for several months. The mine employs between 130 and 140 men. The Reichert mine, which recently ceased operations after it was discovered fire was raging in one of the entries, has remained closed.

A. B. McLaren is having a tippie built to operate a new slope mine on the 80-acre Gent Tract, Carterville. The owner also is negotiating for a railway switch. From forty to sixty men will be employed.

Zeigler District Busier.—Several mines in the Zeigler territory have started work full time. Franco Mine No. 2 and the Bobby Dick mine, north of Herrin, are running, and two of the Franklin County Coal Co.'s mines which have been taking two weeks turn about

also have begun full-time shifts. One of these mines is at Herrin and the other at Royalton. Notices have been posted that Taylor No. 5 and the Royalton mine will work every week instead of two weeks out of four. Reports are that the Old Ben mine at Weaver will also begin work soon.

With the opening of Peabody Mine No. 7, at Kincaid, 800 men were put to work. The mine had been shut down for six months.

Zook Denies Merger Rumor.—Joseph D. Zook, vice-president and general manager of the O'Gara Coal Co., Chicago, has issued an emphatic denial of recent reports naming that company as one to be included in contemplated mergers. "The persistence with which these reports have been made," said Mr. Zook, "makes it seem advisable to announce that the O'Gara Coal Co. is not a party to any plan looking toward the consolidation of its properties with those of any other coal companies. The ownership and management of the company as a single company continues independent of any consolidation."

Will Sell Niantic Property.—Sale of the properties of the bankrupt Niantic Carbon Coal Co. of Macon County has been set for Sept. 11 on the premises of the bankrupt. The properties have been appraised at \$58,000. The sale, by auction, is subject to confirmation by the United States District Court.

Investigate Subsidence.—Engineers for the Donk Brothers Coal & Coke Co. are making an investigation to determine the cause of the sinking of the Madison County Tuberculosis Sanitarium near Edwardsville, Ill. The building began to settle about May 1 when it was opened for use. The structure cost \$300,000 and the damage caused by the settling has been estimated at from \$20,000 to \$50,000. Officials of the coal company question the conclusions of report to the Madison County Board of Supervisors that the settling was due to a squeeze in one of the Donk mines.

INDIANA

Mechanics' Lien Settled.—The suit of about 200 employees of the Knox County Coal Co. to foreclose a labor lien amounting to over \$16,000 has been settled at Bicknell in a conference between attorneys for the mines and a representative of the receiver for the coal company. The men are to get the full amount of their wages. The receiver promises to open the mine immediately and give the men employment. The mine has been closed for several months. The coal company was placed

under receivership by the Superior Court of Marion County.

IOWA

The Clean Coal Co., Gravity, has begun work on a new double shaft which will be about 150 ft. south of the shaft worked last year and will be used for hoisting coal, while the old single shaft will be used as an airshaft.

KANSAS

Start Bankruptcy Proceedings.—Petition of four creditors to have the Patton Coal & Mining Co. of Frontenac adjudged an involuntary bankrupt was filed in the United States District Court at Fort Scott on Aug. 18. The same day the Commerce Trust Company of Kansas City filed suit in that court against the Patton company to foreclose a mortgage given to secure a note for \$43,000, which, with accrued interest, makes the total claim \$45,000. Claims of the four creditors bringing the bankruptcy action total only \$1,668 and are for merchandise supplied the Patton company store. They allege that President J. S. Patton, also was president of the Frontenac State Bank, which recently closed its doors. All funds of the coal company which might have been available to the creditors were lost to them through being deposited in that bank, they aver. The Patton company has been operating mines since the early days of the Pittsburgh district.

KENTUCKY

Sandy Valley Extension Planned.—Right of way is now being obtained for an extension of the Chesapeake & Ohio Ry. up the Levisa River from the forks at Millard. The extension will be approximately thirty miles long and will extend to the Virginia line. It will tap Pike County's greatest coal field. The right of way is being bought by Jeff Tackett, prominent business man of Elkhorn City. The extension will connect with the Big Sandy division of the C. & O. which extends from Ashland to Hellier and to Elkhorn City, where it meets the Carolina, Clinchfield & Ohio.

Notice is given by the Huntington National Bank of Columbus, Ohio, trustee, to holders of the first mortgage 7½ per cent bonds of the Himler Coal Co., of Himlerville, that \$8,000 of the bonds have been called for payment on

Sept. 1. F. G. Hatton, president of Hatton, Brown & Co., Inc., Columbus, is receiver for the corporation.

The Ohio Valley Improvement Association, which for thirty odd years has worked for a 9-ft. stage in the Ohio River and year-round water transportation, will meet at Paducah Oct. 11 and 12 to discuss river terminals for the transfer of combination hauls, involving both rail and river movement.

MINNESOTA

The Clarkson Coal & Dock Co., St. Paul, and the Pittsburgh & Ashland Coal & Dock Co., Minneapolis, creditors of the Western Coal & Coke Co., Minneapolis, have brought suit against the latter company seeking to recover \$8,381 and \$8,429 respectively. Both the plaintiffs are defendants in the suit brought by the Western against ten coal companies some time ago, on the ground of unfair competition and discriminatory practice.

MISSOURI

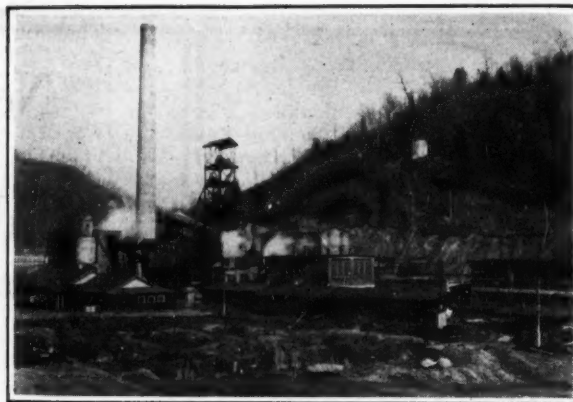
W. E. Tate, Robert Roskill and Jack Coman, of Pittsburg, Kan., are sinking a shaft for a coal mine on the J. S. Guthrie farm, just south of New Bloomfield. The shaft, which is down 20 ft., is located about 300 yards from the state highway between Fulton and New Bloomfield.

NEW YORK

Burns Brothers Earnings Gain.—The report of Burns Brothers and subsidiaries for the June quarter shows a net profit of \$564,846 after depreciation, federal taxes, etc., which is equal, after prior preference and preferred dividends, to \$3.60 per share earned on 97,365 shares of Class A common stock and to \$1.60 per share earned on 97,367 shares of Class B common stock. In the corresponding quarter of 1925 the net was \$416,924, or \$3.21 per share, on

Glen Rogers Mine

This plant, at Glen Rogers, W. Va., was acquired recently by the Old Ben Coal Corporation, Chicago, from the Raleigh-Wyoming Coal Co. The headframe and tippie here shown are auxiliary units. No equipment has been installed yet in or over the main hoisting shaft, which already has been sunk and lined. As the stack indicates, the plant makes its own power.



80,944 shares of Class A common and \$1.21 per share on 80,940 shares of Class B common.

The Koppers Seaboard Coke Co., Inc., New York City, has filed a certificate in the office of the Secretary of State increasing its capital stock from \$600,000 to \$1,000,000.

NORTH DAKOTA

Rupp to Rebuild.—The Rupp Coal Co., Garrison, will soon rebuild the portion of its tippie and machine shop destroyed by fire July 31, with loss reported at \$30,000 including equipment.

OHIO

Monsarrat Mine Ready to Start.—The work of cleaning up mine No. 2 of Monsarrat Bros., Columbus operators, at Drakes, is about completed and word goes out that operations will be started soon. The mine has been idle for more than eight months.

The Sunday Creek Coal Co., Columbus, has been awarded the contract to furnish 21,000 tons of Hocking 2-in. nut, pea and slack to various municipal departments of Columbus at \$1.25 per ton, f.o.b. mines.

PENNSYLVANIA

Hecla Improvements Planned.—The Hecla Coal & Coke Co. has obtained a federal permit to construct four piers, a loading boom and support and for structural steel work at its Isabella mine, Hillcoke, Fayette County, on the Monongahela River.

Samuel T. Brown, receiver of the bankrupt Punxiana Coal & Coke Co., near Punxsutawney, has been directed by the court to sell the entire property except the Juneau mine, which is to be offered for lease. There are several mines in the list.

Governor Pinchot is said to be considering steps to reorganize the state's anthracite miners' examining board system. There have been several vacancies on the board for months and the executive has held up all recommendations for appointment of inspectors.

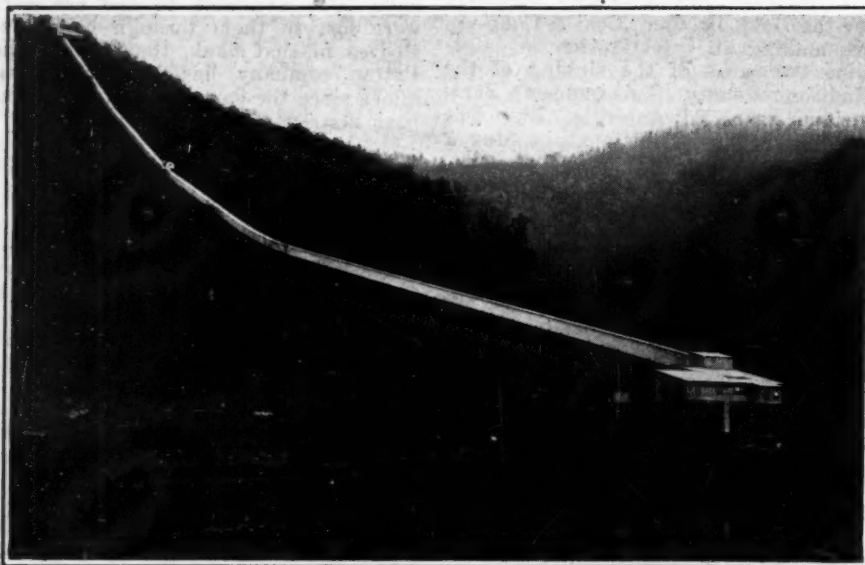
Alaska Breaker Plans Nearly Ready.—The Philadelphia & Reading Coal & Iron Co., it is said, has plans nearly ready for a new breaker at its Alaska colliery, Mount Carmel, to replace the one recently destroyed by fire, with a loss estimated in excess of \$100,000.

Coke Business Improves.—The coke business in the Connellsville region is picking up. The Hustead-Semans Coal & Coke Co. is starting operations and firing all its ovens, at East Middlesboro. The Puritan Coal & Coke Co. is firing 150 additional ovens at Puritan.

VIRGINIA

To Reopen Mine.—The property of the Glen Burke Coal Co., operating at Glen Burke, near Richlands, probably will be again in operation within a few weeks as a result of the public sale of the company's properties at Glen Burke late in August by Receiver J. W. Flanagan. The highest bid for the property—\$56,000—was made by Huntington, W. Va., interests, who offered \$46,000 for the leases and \$10,000 for the machinery.

The State Corporation Commission of Virginia has granted a certificate of authority to the Great Valley Anthracite Corporation, which was a New Jersey Corporation, to mine and deal in coal in Virginia. The company has its principal office at East Radford, Va., with H. C. Tyler in charge.



Stickney No. 11 Mine of the Glogora Coal Co.

This mine, located on the Marsh Fork extension of Big Coal River, in Raleigh County, West Virginia, is equipped with a rope-and-button conveyor 2,659 ft. long. As originally installed there was but one transfer point—at the center. The 1,348-ft. lower section proved to be too long, so a third transfer has been installed, 524 ft. from the railroad tippie. The difference in elevation between the headsheave and tippie is 1,112 ft., and the horizontal distance 2,413 ft. The Glogora company is controlled by the same interests as the North East and South East coal companies of Kentucky.

WEST VIRGINIA

Plan Webster Development.—Plans are under way for the large scale development of coal, oil and gas lands in Webster County by the Guardian Coal & Oil Co. It is reported that the company will ask to list \$2,500,000 stock of par value \$2.50 per share on the New York Curb. The understanding in West Virginia is that a New York syndicate has acquired control of over 7,500 acres of the Guardian lands upon which development work will begin at once.

Consolidation Lets Contracts.—Four contracts recently have been let for the improvement of the plants of the Consolidation Coal Co. One contract calls for the installation of a steel tippie with shaker screens, loading booms, miscellaneous conveyors, etc. at mine No. 25; another for shaker screen equipment, loading booms, etc. at mine No. 32, both in Harrison County, a third for the shaker screen equipment, loading booms, etc. at mine No. 204 at Jenkins, Ky. and the fourth is for the installation of conveying equipment, chutes, etc. for handling various sizes of coal into box cars.

Triadelphia Mine Open-Shop.—Two hundred employees of the Elm Grove Mining Co., controlled by the Paisley interests of Cleveland, are reported to have returned to work in mine No. 2, near Triadelphia, on an open-shop basis.

New Substations for Island Creek.—The Island Creek Coal Co. has awarded the contract for the construction of three substations at its mines near Holden, it was announced last week. The plants will be built at mines Nos. 7, 8 and 14. The buildings will be of steel, with corrugated asbestos siding and roofing, making them entirely fire-proof. The foundations will be of concrete.

Union Denied Injunction.—Judge Warren B. Kittle of the Circuit Court of Barbour County on Aug. 12 denied an injunction sought by the United Mine Workers against the Simpson Creek Collieries Co. to enjoin operation of the company's mines at Galloway on a non-union basis on the ground that it constituted a violation of the Baltimore wage agreement of 1924.

The injunction bill was filed on July 30 by T. C. Townsend, of Charleston. Judge Kittle ruled that the bill of complaint had been improperly drawn. Immediately following the decision attorneys for the union announced that an appeal would be taken to the Supreme Court of West Virginia. Had the restraining order been granted, it would have had the effect of nullifying an injunction previously granted the coal company enjoining members of the miners' union from picketing and otherwise interfering with the operation of the mines of the company at Galloway.

Corona Plans to Rebuild.—Preliminary plans are said to be under consideration by the Corona Coal Co., Hepzibah, near Clarksburg, for rebuilding a portion of its tippie, destroyed by fire on July 30, with a loss said to be approximately \$50,000, including machinery.

Hutchinsons to Build New Plant.—The Hutchinson Coal Co. announces through General Superintendent Claude Ryan that an all-steel tippie is to be erected at the McCandlish mine of the company at a cost of approximately \$35,000. The structure is to be ready for operation by Dec. 1. The new tippie will be equipped with shaker screens, picking tables, loading booms and every other feature to make it strictly up to date. The mine is on Simpson's Creek, where the company owns about 500 acres purchased from the Cook Coal & Coke Co. in 1911. The present capacity of the mine is between 1,000 and 1,500 tons a day but the new tippie will make it possible to increase production to 2,000 tons a day. The mine had been idle until recently, but it is planned to operate the mine at full capacity when improvements are completed.

The Blue Ash Coal Co., of Cincinnati, Ohio, has withdrawn its corporate existence in West Virginia, according to a certificate filed in the office of the Secretary of State at Charleston. Robert H. Deepke is president, E. B. Ulrich, vice-president, and George S. Payne, secretary and treasurer.

White Oak Safety Meet Held.—Employees of the White Oak Coal Co., Macdonald, held their seventh annual first-aid meet at White Oak Ball Park, Scarbro, Aug. 14, with fourteen teams

taking part. The main first-aid contest was won by the Skelton operation, Raleigh County, with a score of 99.3 per cent. Lochgelly Mine, Fayette County, stood second with 98.4. The machine shop of Macdonald and Cranberry, Raleigh County, tied for third, with 97.3. In an artificial-respiration contest six teams made perfect scores. The event was finally decided in favor of the machine shop. Whipple took first place as the best drilled team. Two prizes were awarded to the two neatest appearing teams and were won by the machine shop and Whipple respectively. Interest was especially keen as the first three teams were to take part in the safety demonstration and first-aid contest conducted by the West Virginia Department of Mines at Huntington, Aug. 21.

Wet Branch Issues Bonds.—An issue of \$400,000 first mortgage 7 per cent bonds of the Wet Branch Mining Co. of Pittsburgh, Pa., operating at Dry Branch, was offered recently at 96. The bonds mature in 1941.

CANADA

The East Kootenay Mine Safety Association held its annual mine-rescue and first-aid meet at Fernie, B. C., Aug. 7. Six teams took part in the mine-rescue contest, five in the senior first-aid, three in the ladies' first-aid and the same number in the junior first-aid as well as the first-year first-aid. The winners were: Mine-rescue, Coal Creek No. 1, 99.4 per cent; senior first-aid, Fernie No. 1, 99 per cent; ladies' first-aid, Fernie, 97 per cent; junior first-aid, Michel, 88 per cent; first-year first-aid, tie between Fernie and Coal Creek, 92 per cent.

A new mine is being sunk at Dominion by the British Empire Steel Corporation. The new mine, which is known as No. 23, has been sunk to tap what is termed the old Gardner seam. A thorough inspection of the new mine was made last week by Roy M. Wolvin, president; J. E. McLurg, vice president, and H. J. McCann, general manager of the corporation's coal-mining operations. The trio of executives later made a tour of inspection that included all of the larger pits on Cape Breton island.

Mine Garages

Those who visit the mines are well acquainted with the large number of automobiles that are seen parked around the upper-works. In mountainous regions level ground is at a premium with the result that garages are bunched in the valleys and near the main thoroughfares. The steel garages here shown are a few of those erected in a mining town in the West Virginia mountains. These buildings are fairly cheap and substantial and rent for an amount that yields a fair return.



Among the Coal Men

Meyers Y. Cooper, who was nominated for Governor of Ohio by the Republicans at the primaries Aug. 10, though a real estate operator of no mean proportions, has been connected with the coal mining business for several years. Mr. Cooper with his brother-in-law and Charles Tribbey developed three mines in the Hazard and Jellico districts in Kentucky and when both of these died he continued his interest in the coal business now owning a large share of the Midland Coal Mining Co., operating in the Hazard field, and in the Midland Coal Sales Co., of Cincinnati.

W. H. Jones, State Mine Inspector of Lexington, Ky., was appointed on Aug. 10 by Governor W. J. Fields as a delegate from Kentucky to the fifth annual International First-Aid and Mine-Rescue Meet at San Francisco.

Fred W. Lyon, formerly with the H. C. Frick Coke Co., later connected with the J. V. Thompson interests as resident engineer in charge of construction of coke plants and more recently of the sinking of shafts and development of mines in Fayette County, Pennsylvania, has been appointed assistant chief engineer of the Department of Public Works of Pittsburgh. The post carries a salary of \$7,500 a year.

Leigh Willard, of 52 Vanderbilt Avenue, New York City, has taken over the management of the Winifrede Coal Co. He has been elected president and general manager, effective Sept. 1, 1926. The Winifrede properties are located at Winifrede and Crown Hill, Kanawha County, W. Va., on the Chesapeake & Ohio Ry. and Kanawha River. Mr. Willard was vice-president of W. J. Rainey, Inc., for many years, having operating charge of their coal properties as well as the byproduct coke plant of Rainey-Wood Coke Co., Philadelphia. More recently Mr. Willard has been engaged in the development and management of coal, coke and gas properties, particularly in connection with the Hudson Valley Coke & Products Corporation at Troy, N. Y.

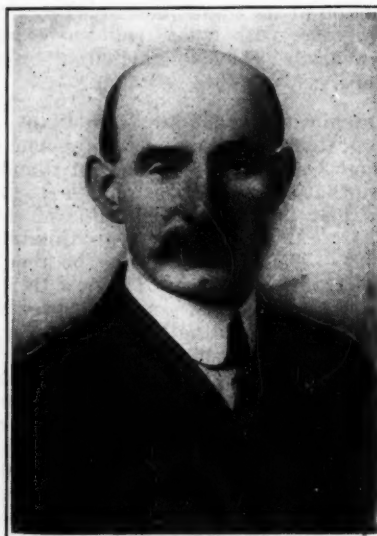
R. E. Galloway, general manager of the Galloway Coal Co., with general offices in Memphis, Tenn., announces that W. F. Cobb has been appointed assistant general manager, effective Aug. 16, and will be in charge of the company's mines at Carbon Hill, Ala., where he will make his headquarters. James Nicol, Jr., general superintendent, has resigned and this position has been discontinued.

Dever C. Ashmead, engineer with the U. S. Bureau of Mines and formerly anthracite editor of *Coal Age*, will resign from the government service, effective, Oct. 1 to accept the vice-presidency of the Hydrotator Co., which controls patents on coal cleaning.

James D. Monie has been appointed general sales manager for the Deringer

Fuel Co. of Spangler, Cambria Co., Pa. He will be located in the Bowling Green Building, 11 Broadway, New York City. Mr. Monie was connected with the Pennsylvania Coal & Coke Co. for several years and more recently with the Titan Fuel Corporation.

Obituary



The late George Wilkinson

George Wilkinson, chief inspector of mines for the Province of British Columbia, died after a short illness at Victoria on Aug. 11, age 51. Mr. Wilkinson went to Vancouver Island from England in 1896 and started work as a miner at Nanaimo for the Western Fuel Corporation. He worked his way up until he was appointed general superintendent of mines for the company. In 1917 he left the company to become chief inspector of mines, a position which he relinquished in 1920 to become general manager for the Pacific Coast Coal Co. In 1923 Mr. Wilkinson was again given the position of chief inspector of mines. He was largely responsible for a number of improvements for safeguarding the miners, which have been introduced into the mining laws of the Province.

G. P. Morrison, president of the Marion Coal Co., Lexington, Ky., and formerly a partner in the Dudley Coal Co., Lexington, died there on Aug. 15, following a short illness. Mr. Morrison was well known in coal circles for some years. His company owns a mine in the Hazard field.

Frank Oberrender, for the past 19 years sales agent at New York for the Philadelphia & Reading Coal & Iron Co., died in the Lenox Hill Hospital, New York City, on Aug. 19. He was about 65 years of age and had been connected, in various capacities with the Reading company for 45 years. Mr.

Oberrender was born in Ashley, Pa., and for a time worked about the mines. He is survived by his widow and two sons, Dr. Girard Oberrender, of New York City and Willard Oberrender, of East Orange, N. J. Funeral services were held Aug. 23.

Association Activities

New River Coal Operators' Association met at the White Oak Country Club, near White Oak, W. Va., on Aug. 11, with more than 250 operators and guests in attendance. Besides members of the association there were present operators from the Winding Gulf, Kanawha, Greenbrier and Pocahontas fields and operating and traffic officials of the Chesapeake & Ohio and the Norfolk & Western railroads. The American Railway Association and the Chicago Retail Coal Merchants' Association also had representatives at the meeting. Walter H. Cunningham was present as the representative of the West Virginia Coal Operators' Association, while the National Coal Association was represented by Walter Barnum, its president, and D. H. Pape, assistant to the executive secretary. Harry Caperton, a director of the National from West Virginia, also was present. Mr. Barnum gave an interesting and convincing talk on the value of association work to the operator. For the most part five-minute addresses were the order of the day and every speech emphasized the close relationship between the coal industry and the railroads and the necessity for greater co-operation between these two major industries. Other interesting features were an excellent luncheon served by the club and a golf tournament under the auspices of the association.

G. H. Merryweather, president of the American Wholesale Coal Association, has appointed the following committees for the current year: Traffic—E. M. Platt (chairman), Chicago; J. W. Dykstra, Detroit, Mich.; George M. Kearns, Cincinnati, Ohio. Trade Relations—H. K. Cortright (chairman), Philadelphia, Pa.; E. H. Heminway, Hartford, Conn.; Seth W. Morton, Albany, N. Y. Public Relations—L. F. Leighton (chairman), Boston, Mass.; G. N. Snider, New York City; R. B. Starek, Chicago; Ira C. Cochran, Washington, D. C.

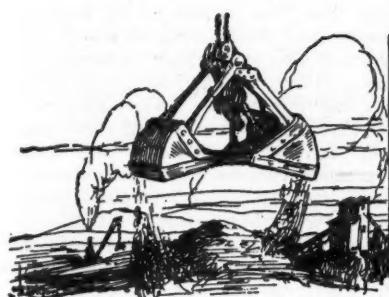
Recent Patents

Loading Machine; 1,586,573. Norton A. Newdick, Columbus, Ohio, assignor to the Coloder Co., Columbus, Ohio. June 1, 1926. Filed June 21, 1922; serial No. 569,996.

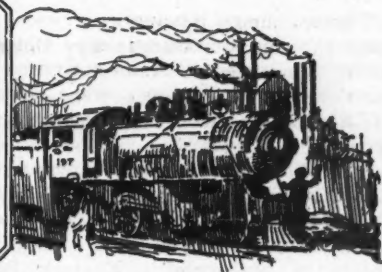
Mine-Ventilating System; 1,586,660. R. T. F. Dodds, Welland, Ontario, Canada. June 1, 1926. Filed Sept. 6, 1924; serial No. 736,325.

Miner's Cap; 1,586,701. Andrew Reppa, Barton, Ohio. June 1, 1926. Filed Dec. 15, 1925; serial No. 75,558.

Portable Coal Tipple; 1,586,922. Grover C. Singer, Oakland City, Ind. June 1, 1926. Filed July 22, 1924; serial No. 727,526.



Production And the Market



Overseas Exports Exercise Marked Influence on Bituminous Trade; Anthracite Improves

The influence of export shipments still predominates in the bituminous coal markets of the country. General domestic business is heavy, though somewhat unevenly distributed, but the movement for inland consumption is largely routine. The export trade, on the other hand, leaves its impress on both tonnage and prices and adds to the market that element of speculative interest in what each week may bring forth which lifts day-to-day trading out of the doldrums.

Measured by the total output of the bituminous mines, the actual quantity of soft coal loaded for overseas shipment is inconsequential. Considered in relation to normal performance in that field, however, these shipments assume a deep importance. Last week, for example, between 450,000 and 500,000 net tons were loaded for the United Kingdom. Total export and foreign bunker business from Hampton Roads to Aug. 15 was nearly 3,000,000 tons ahead of last year. Temporary as these gains admittedly are, for the time being their effect upon sentiment and actual prices cannot be denied.

Low-Volatile Prices Boom

Quotations on low-volatile coals have reacted much more violently the past fortnight than was the case when the export buying first began to affect the high volatiles. Navy Standard at the Roads for New England delivery went up 35 @ 50c. per ton in a week. Prices on lump Pocahontas and New River at Chicago advanced 25 @ 50c. Pool 1 coal for New York tide-water shipment, on the other hand, weakened slightly.

These gains, and increases in prices on central Pennsylvania coals and scattering sizes of other grades in certain markets, checked the effect of the declines in other directions—notably in spot gas coals, both Pittsburgh

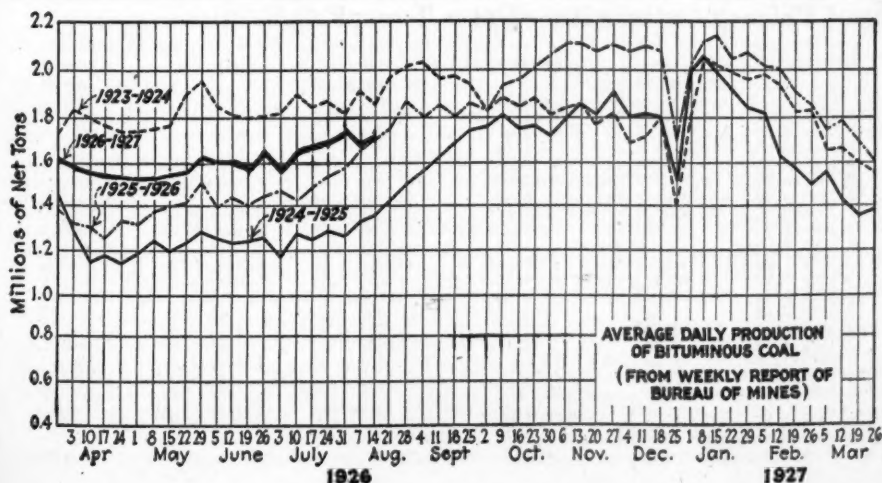
and West Virginia, and in open market prices on steam sizes in the Illinois and Indiana districts. *Coal Age* Index of spot bituminous prices on Aug. 23 stood at 165 and the corresponding price was \$2, an increase of one point and 1c. over the figures for Aug. 16.

Production Well Maintained

Weekly production holds well over 10,000,000 tons. The output for the week ended Aug. 14 was estimated at 10,626,000 net tons. Preliminary data for last week indicate only a slight recession in the average raised. Overseas exports are absorbing about 5 per cent of the current output. The lake trade is taking close to 10 per cent. Dumpings at the lower lake ports during the week ended Aug. 22 totaled 807,651 tons of cargo and 53,192 tons of vessel fuel. This brings the season's total to 17,458,215 tons, as against 15,328,093 tons last year and 12,926,230 tons in 1924.

There is a distinctly more optimistic tone in the anthracite trade as the fall season approaches. Unless there should be a last-minute shift in plans, there is little likelihood that the large company producers will make any change in their circulars on the domestic sizes. Independent shippers undoubtedly will try to recover what they lost in sacrifice sales this summer as soon as conditions warrant. The spot steam coal market is slightly stronger.

Contract inquiries for Connellsville furnace coke tonnage have caused many producers to revise their ideas of what their product should bring. Although some business is understood to have been closed at less than \$3.25, ovens now talk of \$3.50 as a proper minimum on future contract business. Spot prices are firm at \$3@3.25 on furnace and \$4@\$4.50 on foundry coke. Output shows little variation.



Estimates of Production

(Net Tons)

BITUMINOUS

	1925	1926
July 31.....	9,457,000	10,540,000
Aug. 7.....	9,971,000	10,150,000
Aug. 14 (b).....	10,261,000	10,626,000
Daily average.....	1,710,000	1,771,000
Cal. yr. to date..... (c)	293,643,000	331,755,000
Daily av. to date.....	1,536,000	1,734,000

ANTHRACITE

July 31.....	2,036,000	2,066,000
Aug. 7 (b).....	2,011,000	1,843,000
Aug. 14.....	1,857,000	1,934,000
Cal. yr. to date..... (c)	56,376,000	48,459,000

BEEHIVE COKE

Aug. 7 (a).....	123,000	166,000
Aug. 14 (b).....	124,000	163,000
Cal. yr. to date..... (c)	6,057,000	7,737,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years.

Boom in Eastern Coals

Further sharp advances in prices on Eastern coals featured the Chicago market last week. Asking figures on smokeless lump and egg were boosted to \$4@4.25; first grade mine-run brought \$2.25@2.35. Choice high-volatile West Virginia and southeastern Kentucky block went to \$2.50@2.75 and egg to \$2@2.25, with some specialty coals selling higher. Mine-run from the high-volatile Eastern fields was held at \$1.65@1.85.

Demand for southern Illinois domestic coals was indifferent and for other Illinois and Indiana offerings something less than fair. The steam market, too, was quiet, with no indications of any early revival or upswing in prices. A number of operators are putting their screenings in storage to avoid the low prices now paid on forced sales. Country prices have been held up to \$1.75@1.85, but tonnage has sold down to \$1.25 in Chicago.

All mines now operating in the southern Illinois counties are carrying "no bills" of the smaller sizes and there are few, if any, collieries which can not make prompt shipment of the larger sizes. Egg and nut coals drag. Mines are not averaging more than two to four days. Conditions in the Duquoin and Jackson County districts are unchanged. There is a slight improvement in domestic trade in the Mt. Olive district, but railroad tonnage is the real standby.

The Standard field continues to lose business in the St. Louis market to the western Kentucky operators. In St. Louis locally, the latter also seem to be crowding out Mt. Olive. There is more life to the movement of anthracite, smokeless and coke, especially the last named, but oil, gas and electricity have cut heavily into this class of trade.

Kentucky Market Stronger

The situation in Kentucky reveals a marked improvement. Lake trade is

keeping the free tonnage of eastern Kentucky coal down and a wider all-rail market aids in further reducing the surplus. Moreover, the fact that slack also is moving to the lakes has prevented the usual plethora of fine coal. General industrial demand for both eastern and western Kentucky coal is good and the buying of prepared sizes for domestic consumption is rising.

Western Kentucky block is strong at \$1.75, with some offerings bringing up to \$2. Eastern Kentucky block ranges from \$2.50 to \$3, with little to be picked up under the minimum quoted. A minimum of \$2 now is asked on 2-in. lump, which runs to \$2.50. Mine-run is \$1.50 @ \$1.85; slack, \$1.15@1.20. Further increases in both fields are considered likely.

Orders Increase at Docks

The volume of business coming into the docks at the Head of the Lakes for September delivery has been expanding rapidly the past fortnight and operators are much encouraged over

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Aug. 24 1925	Aug. 9 1926	Aug. 16 1926	Aug. 23 1926†
Smokeless lump.....	Columbus....	\$3.85	\$3.35	\$3.75	\$3.50@4.00	
Smokeless mine run.....	Columbus....	2.10	2.15	2.15	2.00@2.30	
Smokeless screenings.....	Columbus....	1.50	1.40	1.40	1.35@1.50	
Smokeless lump.....	Chicago....	3.85	3.35	3.60	4.00@4.25	
Smokeless mine run.....	Chicago....	2.25	2.00	2.20	2.25@2.35	
Smokeless lump.....	Cincinnati....	3.75	3.35	3.50	3.75@4.00	
Smokeless mine run.....	Cincinnati....	2.50	2.10	2.10	2.25@2.50	
Smokeless screenings.....	Cincinnati....	1.55	1.35	1.35	1.40@1.65	
Smokeless mine run.....	Cincinnati....	4.65	5.05	5.00	5.35@5.50	
Clearfield mine run.....	Boston....	1.75	1.75	1.85	1.75@2.00	
Cambria mine run.....	Boston....	1.95	2.05	2.05	1.90@2.25	
Barnes mine run.....	Boston....	1.85	1.85	1.95	1.85@2.10	
Pool 1 (Navy Standard).....	New York....	2.55	2.60	2.60	2.40@2.75	
Pool 1 (Navy Standard).....	Philadelphia....	2.60	2.65	2.65	2.50@2.80	
Pool 1 (Navy Standard).....	Baltimore....	1.95	2.15	2.15	2.15@2.20	
Pool 9 (Super. Low Vol.).....	New York....	2.00	2.05	2.05	1.90@2.25	
Pool 9 (Super. Low Vol.).....	Philadelphia....	2.00	2.10	2.10	2.00@2.25	
Pool 9 (Super. Low Vol.).....	Baltimore....	1.75	1.85	1.85	1.80@1.90	
Pool 10 (H.Gr. Low Vol.).....	New York....	1.80	1.85	1.85	1.75@2.00	
Pool 10 (H.Gr. Low Vol.).....	Philadelphia....	1.70	1.85	1.85	1.75@2.00	
Pool 10 (H.Gr. Low Vol.).....	Baltimore....	1.65	1.75	1.75	1.80@1.85	
Pool 11 (Low Vol.).....	New York....	1.60	1.70	1.70	1.60@1.85	
Pool 11 (Low Vol.).....	Philadelphia....	1.55	1.55	1.55	1.45@1.70	
Pool 11 (Low Vol.).....	Baltimore....	1.45	1.70	1.65	1.60@1.60	
High-Volatile, Eastern		Market Quoted	Aug. 24 1925	Aug. 9 1926	Aug. 16 1926	Aug. 23 1926†
Pool 54-64 (Gas and St.).....	New York....	1.55	1.40	1.40	1.35@1.50	
Pool 54-64 (Gas and St.).....	Philadelphia....	1.50	1.45	1.45	1.40@1.55	
Pool 54-64 (Gas and St.).....	Baltimore....	1.40	1.45	1.45	1.50@1.60	
Pittsburgh sc'd gas.....	Pittsburgh....	2.50	2.25	2.25	2.15@2.25	
Pittsburgh gas mine run.....	Pittsburgh....	2.15	2.00	2.00	1.90@2.00	
Pittsburgh mine run (St.).....	Pittsburgh....	1.95	1.75	1.75	1.60@1.90	
Pittsburgh slack (Gas).....	Pittsburgh....	1.55	1.25	1.25	1.20@1.30	
Kanawha lump.....	Columbus....	2.45	2.25	2.25	2.00@2.50	
Kanawha mine run.....	Columbus....	1.60	1.60	1.60	1.50@1.75	
Kanawha screenings.....	Columbus....	1.30	1.10	1.15	1.10@1.25	
W. Va. lump.....	Cincinnati....	2.35	2.35	2.50	2.00@2.60	
W. Va. gas mine run.....	Cincinnati....	1.60	1.65	1.80	1.65@1.85	
W. Va. steam mine run.....	Cincinnati....	1.50	1.50	1.60	1.50@1.60	
W. Va. screenings.....	Cincinnati....	1.20	1.10	1.10	1.00@1.25	
Hooking lump.....	Columbus....	2.60	2.35	2.35	2.35@2.50	
Hooking mine run.....	Columbus....	1.65	1.55	1.55	1.40@1.75	
Hooking screenings.....	Columbus....	1.45	1.10	1.20	1.15@1.25	
Pitts. No. 8 lump.....	Cleveland....	2.25	2.15	2.15	1.85@2.50	
Pitts. No. 8 mine run.....	Cleveland....	1.85	1.75	1.75	1.75@1.80	
Pitts. No. 8 screenings.....	Cleveland....	1.40	1.35	1.30	1.30@1.40	
Midwest		Market Quoted	Aug. 24 1925	Aug. 9 1926	Aug. 16 1926	Aug. 23 1926†
Franklin, Ill. lump.....	Chicago....	\$3.10	\$3.00	\$3.00	\$3.00	
Franklin, Ill. mine run.....	Chicago....	2.35	2.40	2.40	2.35@2.50	
Franklin, Ill. screenings.....	Chicago....	1.95	1.80	1.80	1.80@1.85	
Central, Ill. lump.....	Chicago....	2.60	2.60	2.60	2.50@2.75	
Central, Ill. mine run.....	Chicago....	2.10	2.10	2.10	2.15@2.25	
Central, Ill. screenings.....	Chicago....	1.55	1.50	1.50	1.40@1.60	
Ind. 4th Vein lump.....	Chicago....	2.85	2.60	2.60	2.50@2.75	
Ind. 4th Vein mine run.....	Chicago....	2.35	2.25	2.25	2.15@2.35	
Ind. 4th Vein screenings.....	Chicago....	1.60	1.75	1.75	1.65@1.75	
Ind. 5th Vein lump.....	Chicago....	2.35	2.35	2.35	2.25@2.50	
Ind. 5th Vein mine run.....	Chicago....	1.95	2.00	2.00	1.90@2.10	
Ind. 5th Vein screenings.....	Chicago....	1.45	1.50	1.50	1.40@1.60	
Mt. Olive lump.....	St. Louis....	2.50	2.35	2.35	2.25@2.50	
Mt. Olive mine run.....	St. Louis....	2.00	2.15	2.15	2.15	
Mt. Olive screenings.....	St. Louis....	1.75	1.55	1.55	1.50@1.60	
Standard lump.....	St. Louis....	2.25	2.25	2.25	2.25	
Standard mine run.....	St. Louis....	1.80	1.80	1.80	1.75@1.85	
Standard screenings.....	St. Louis....	1.30	1.35	1.35	1.25@1.50	
West Ky. block.....	Louisville....	1.85	1.65	1.70	1.75@1.85	
West Ky. mine run.....	Louisville....	1.30	1.20	1.20	1.10@1.35	
West Ky. screenings.....	Louisville....	.75	.90	.90	.80@1.00	
West Ky. block.....	Chicago....	2.25	1.75	1.75	1.60@1.75	
West Ky. mine run.....	Chicago....	1.20	1.15	1.15	1.00@1.25	
South and Southwest		Market Quoted	Aug. 24 1925	Aug. 9 1926	Aug. 16 1926	Aug. 23 1926†
Big Seam lump.....	Birmingham..	2.00	2.25	2.25	2.00@2.50	
Big Seam mine run.....	Birmingham..	1.75	1.85	1.85	1.75@2.00	
Big Seam (washed).....	Birmingham..	1.85	2.00	2.00	1.75@2.25	
S. E. Ky. block.....	Chicago....	2.80	2.40	2.55	2.50@2.75	
S. E. Ky. mine run.....	Chicago....	1.95	1.65	1.65	1.60@1.90	
S. E. Ky. block.....	Louisville....	3.00	2.50	2.50	2.25@2.75	
S. E. Ky. mine run.....	Louisville....	1.60	1.55	1.55	1.50@1.85	
S. E. Ky. screenings.....	Louisville....	1.15	1.10	1.10	1.10@1.25	
S. E. Ky. block.....	Cincinnati....	2.70	2.35	2.35	2.25@2.50	
S. E. Ky. mine run.....	Cincinnati....	1.60	1.60	1.70	1.60@1.85	
S. E. Ky. screenings.....	Cincinnati....	1.15	1.00	1.10	1.00@1.25	
Kansas lump.....	Kansas City..	4.35	4.25	4.25	4.25	
Kansas mine run.....	Kansas City..	3.10	3.00	3.00	3.00	
Kansas screenings.....	Kansas City..	2.50	2.50	2.50	2.35	

* Gross tons, f.o.b. vessel, Hampton Roads

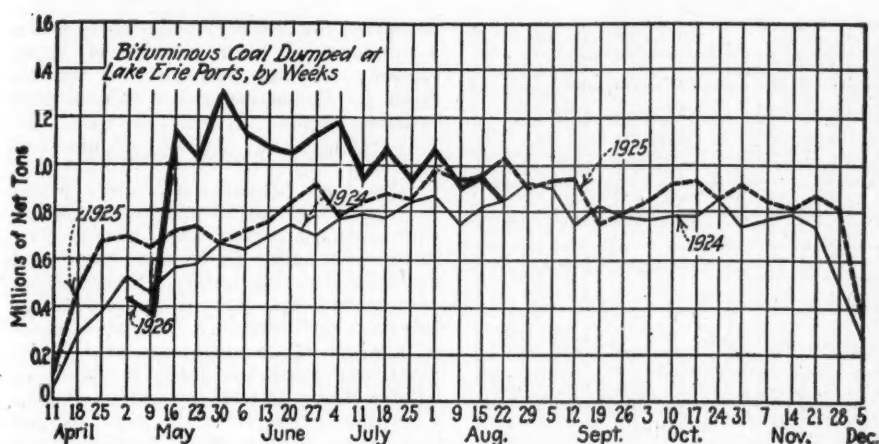
† Advances over previous week shown in heavy type, declines in italics

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	August 24, 1925		August 16, 1926		August 23, 1926†	
			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....	\$2.34		\$8.20@8.90		\$8.50@9.25		\$8.50@9.25
Broken.....	Philadelphia....	2.39		8.25@8.90		8.50@9.15		8.50@9.15
Egg.....	New York....	2.34	\$9.75@10.25	8.65@8.90	\$9.25	8.75@9.25	\$9.25	8.75@9.25
Egg.....	Philadelphia....	2.39	8.90@9.70	8.70@8.85	8.60@9.00	8.75@9.25	8.75@9.25	8.75@9.25
Egg.....	Chicago....	5.06	8.17@8.60	8.03@8.28	9.00@9.75	9.00@9.15	9.00@9.75	9.00@9.15
Stove.....	New York....	2.34	10.00@10.75	9.15@9.40	8.14	8.13	8.14	8.13
Stove.....	Philadelphia....	2.39	9.15@10.75	9.15@9.30	9.00@9.50	9.25@9.50	9.00@9.50	9.25@9.50
Stove.....	Chicago....	5.06	8.71@8.90	8.48@8.80	9.15@10.20	9.35@9.50	9.15@10.20	9.35@9.50
Chestnut.....	New York....	2.34	9.75@10.25	8.65@8.90	8.59	8.33@8.58	8.59	8.33@8.58
Chestnut.....	Philadelphia....	2.39	9.15@10.15	8.85@8.90	8.35@8.85	8.75@9.15	8.50@9.00	8.75@9.15
Chestnut.....	Chicago....	5.06	8.35@8.60	8.28@8.50	8.50@9.75	9.00@9.15	8.50@9.75	9.00@9.15
Pea.....	New York....	2.22	5.50@6.00	5.00@5.55	8.39	8.33@8.53	8.39	8.33@8.53
Pea.....	Philadelphia....	2.14	5.50@5.90	5.00@5.50	6.00@6.50	6.00@6.50	6.00@6.50	6.00@6.50
Pea.....	Chicago....	4.79	5.18@5.36	5.05@5.36	6.00@6.75	6.00@6.50	6.00@6.75	6.00@6.50
Buckwheat No. 1.....	New York....	2.22	2.30@2.60	2.50	6.03	6.10	6.03	6.10
Buckwheat No. 1.....	Philadelphia....	2.14	2.50@2.75	2.50	1.75@2.25	3.00@3.50	1.75@2.25	3.00@3.50
Rice.....	New York....	2.22	2.10@2.30	2.00	2.25@2.75	1.85@2.50	2.25@2.75	1.85@2.50
Rice.....	Philadelphia....	2.14	2.00@2.25	2.00	2.00@2.25	1.40@1.85	2.00@2.25	1.40@1.85
Barley.....	New York....	2.22	1.50@1.75	1.50@1.60	2.00@2.25	1.75@2.25	1.30@2.00	1.75@2.25
Barley.....	Philadelphia....	2.14	1.50@1.75	1.50	1.75@2.25	1.75@2.25	1.25@1.50	1.75@2.25
Birdseye.....	New York....	2.22			1.25@1.75	1.50@1.75	1.25@1.75	1.50@1.75

* Net tons, f.o.b. mines.

† Advances over previous week shown in heavy type declines in italics.



the demand for industrial coal. One of the most interesting tendencies is the growth of the market for screenings, brought about by the increase in the number of mechanically-stocked fire-rooms. Dock screenings no longer meet the demand and lake orders now include cargoes of the smaller coal.

Northwestern retailers are backward in placing storage orders, but anthracite buying now is on a better basis in Minnesota, North Dakota and northern Wisconsin. From present indications there will be little decrease in the tonnage of anthracite moved and a gain in the volume of smokeless coal. Hard coal dock prices are firm at \$13.20 for egg, \$13.60 for stove, \$13.45 for nut, \$11.05 for pea, and \$6.50 for buckwheat. Pocahontas lump and egg are \$7.25; stove, \$7; mine-run, \$5.25; slack, \$4.25.

The country market drawing on the Twin Cities is beginning to show more life in both the retail and steam divisions and the general industrial outlook is promising. Season considered, the Milwaukee trade is enjoying a satisfactory demand. Notwithstanding recent increases in prices, Pocahontas continues to command the attention of consumers. Anthracite, too, is being ordered at a more liberal rate by the householders. An early advance in bituminous prices is expected.

Southwestern Market Stronger

Some improvement in the call for domestic coal was registered in the Kansas and Arkansas fields the past week. Oklahoma, however, still lags behind. A temporary car shortage in Kansas enabled the operators to clean up most of their "no bills." Contracting of screenings at \$2.35 or less is fairly active. Revived interest in storage coal was responsible for the better feeling in Arkansas.

There has been very little change in demand for Colorado domestic coals in the past few days. Mines are operating 55 to 65 per cent of capacity. Steam business is well maintained. The coke ovens, too, report activity. Denver quotations on Colorado and Wyoming coals continue on the Aug. 1 basis.

The Utah market is draggy. Although movement of domestic coal in recent weeks has been disappointing, operators are planning to withdraw the special \$3 price on lump and nut, established last May to relieve the slack situation by increasing production. The price on all coal larger than nut is to be advanced to \$4, with nut at \$2.75; screened slack, \$2.25 and straight slack, \$1.50. Kemmerer lump is quoted at

\$4.50, mines; nut, \$3.75. Rock Springs lump is \$4; nut, \$3.50. Wyoming slack is bringing \$1.50 in the spot market and \$1.35 on contracts.

Lake Buying More Active

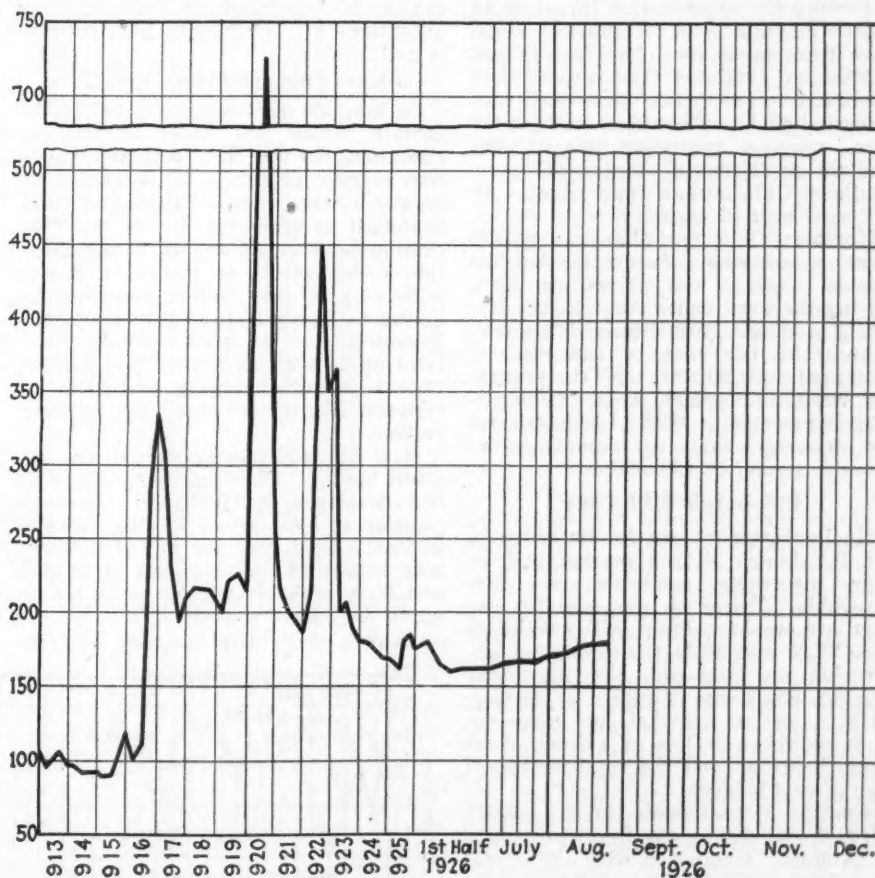
Buying for lake cargo shipment shows renewed activity in the Cincinnati market because the demurrage obligations are out of the way and shippers face the usual fall spurt in business. Tidewater movement also continues heavy and all-rail inland tonnage is growing. The local retail situation is unchanged. River traffic, menaced for a few days by flood conditions, is approaching normal.

Low-volatile coal prices have reacted most sharply to the trading stimulus. Mine-run and slack are feeling the effects of broader buying. The former is bringing \$2.25@2.50 in Western markets and slack, after four months of price inactivity, has jumped to \$1.40 @ \$1.65. Lump and egg move freely at \$3.75, but encounter sales resistance at \$4.

Prepared Sizes Stronger

Prepared sizes of the better grades of high-volatile coal have found a steadily expanding market. Some shippers are booked up on domestic sizes until late in December. Producers without regular sales outlets do not fare as well. Mine-run, however, is not in the same class with the favored block, lump and egg. Some gas and byproduct mine-run has sold down to \$1.65, although the average price is \$1.75 and occasional sales are made at \$1.85. Slack prices are in a rut.

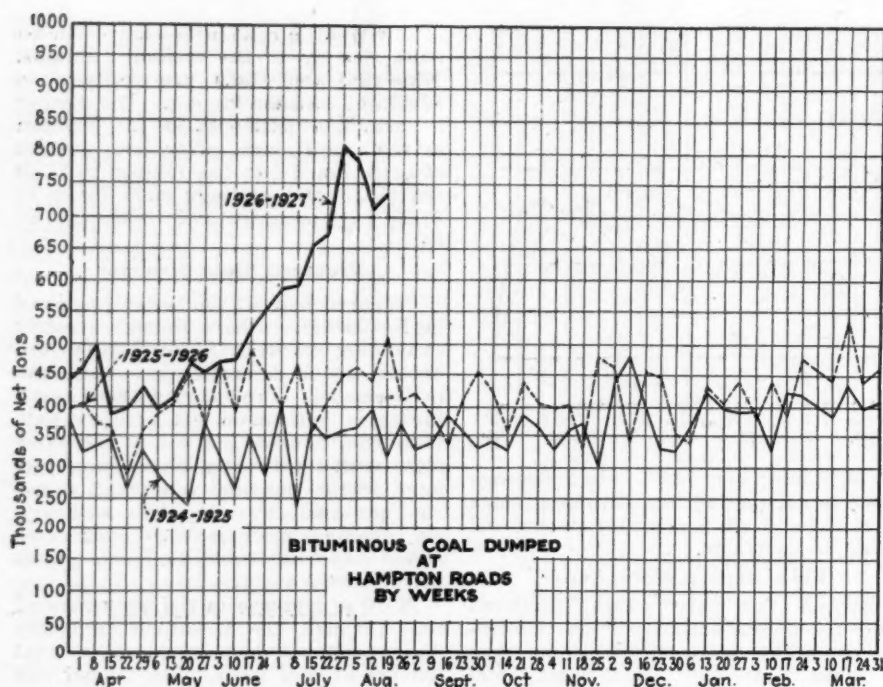
Another increase in the movement of coal through the Cincinnati gateway was registered last week. The total number of coal loads interchanged was 14,638 cars, an increase of 1,260 cars over the preceding week, but 924 cars less than a year ago. Loaded cars en route to the lakes for transshipment totaled 3,496, a decrease of 296 cars when compared with the preceding week. The interchange movement of



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926	1925	1924
Aug. 23	165	164	162
Aug. 16	164	162	159
Aug. 9	162	159	172
Aug. 2	159	172	165
Aug. 24	172	208	165
Aug. 25	165		
Weighted average price	\$2.00	\$1.99	\$1.96

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.



empties for coal loading also was greater and railroad officials already are warning shippers to unload promptly to forestall a car shortage.

Greater strength was noticeable in the Ohio domestic market last week. Following the appreciation in prices on West Virginia and Kentucky coals, more firmness has been displayed in quotations on southern Ohio grades and minimums on domestic sizes have advanced slightly. The steam trade, however, remains moribund despite the gradual depletion of storage reserves. Southern Ohio output approximates 18 to 20 per cent of capacity.

Northern Ohio, too, finds the outlook more encouraging. Production has increased slightly and prices are firm. During the week ended Aug. 14, the No. 8 field produced 230,000 tons, or approximately 33 per cent of capacity, as compared with 202,000 tons the preceding week and 250,000 tons the corresponding period in 1925. Local demand for smokeless coals for domestic purposes is strong at Cleveland.

Pittsburgh Still Lags

No improvement can be discerned in the Pittsburgh district market and, in some directions, conditions are less favorable. Prices on gas coal for export are weaker: lump will not bring over \$2.25 and \$2 is the maximum obtainable on mine-run. In the home market, gas lump is quoted at \$2.15@ \$2.25, a loss of a nickel, and mine-run is \$1.90@ \$2, a decline of a dime. Line trade holds up and the total consumption of coal is large.

Central Pennsylvania loaded 28,077 cars of coal during the first two weeks of August. Compared with the corresponding period last month this was an increase of 2,690 cars. Increased demand for bunker coal and some export business are helping the situation. Advances have been made in all pools except 1 and 18. Current quotations are: Pool 1, \$2.50@ \$2.75; pool 71, \$2.30@ \$2.45; pool 9, \$2.15@ \$2.25; pool 10, \$1.90@ \$2.10; pool 11, \$1.75@ \$1.80; pool 18, \$1.65@ \$1.70.

There has been no real change in the

bituminous situation at Buffalo. Coal men trying to wrest a market from anthracite decay increases in mine prices on low volatile as playing into the hands of the hard coal interests. Except for these increases, and a decline to \$1.20 @ \$1.30 in Youghiogeny slack, nominal quotations are unchanged and business is dull.

New England Prices Erratic

So long as negotiations to settle the British strike fall short of success, quotations in the New England steam coal market probably will continue an erratic upward course. Prices on Navy Standard at Hampton Roads are fluctuating between \$5 and \$5.50 per gross ton, f.o.b. vessels at Hampton Roads, with only a very slight pressure required to force them to the top figure. Steamers for offshore cargoes have piled up to such an extent that demurrage is a regular thing and there is frequent inquiry for small lots to clear vessels.

New England consumers still are coy about buying. Only scattering business has developed, but shippers are in a position to keep prices moving steadily upward. Spot coal for inland delivery now brings \$6.25 f.o.b. cars at Boston and \$6.50 probably will be asked before many days have passed.

As yet, very little business has ma-

terialized for Pennsylvania coals. Quite a tonnage of high volatile is being loaded in foreign bottoms, but the demand for Pennsylvania low volatile still is quiet.

Exports Interest Seaboard

New York bituminous traders found the export situation more interesting than local business last week. The latter was dull. There were plenty of inquiries, but few orders. Prices, however, were firmer and optimism over the future is undiminished. The persistence with which large consumers neglect replenishing stockpiles leads the trade to believe that a buying movement of considerable proportions is just around the corner. There are no large accumulations of coal at tidewater.

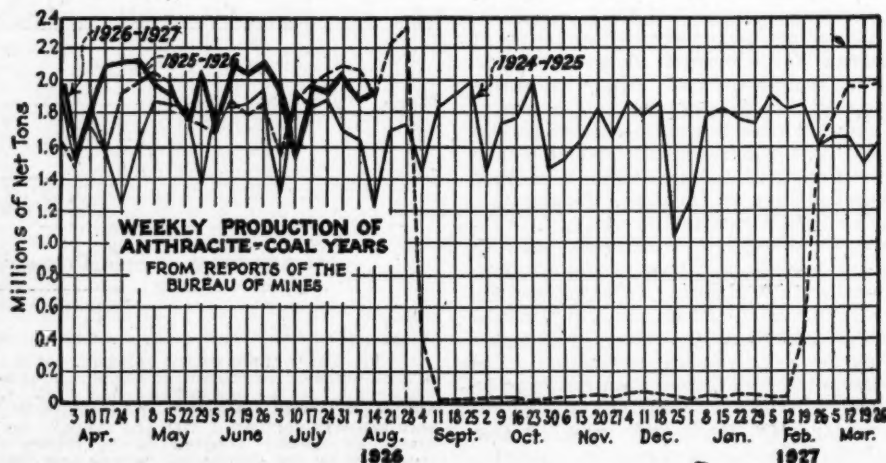
Dissatisfaction with price bases is still voiced by the Philadelphia coal men, but the volume of tonnage moving is cheering. Not only are industries buying liberally for current requirements, but many are building up storage reserves and contract customers are taking in extra tonnage. This development is attributed to the British strike. Local factors in the high-volatile trade grow more hesitant in naming prices for forward shipment because of the export demand. Export loadings at Philadelphia are light and represent the overflow from the southern piers.

Foreign trade is the big thing in the Baltimore market at the present time. Dumpings for export the first half of the month exceeded 250,000 tons, and the piers still are busy. Bunker business, too, is increasing. With the greater pull on tonnage from foreign buyers, advances in quotations for local or inland delivery are forecast. Many domestic industries have been indifferent to trade currents and may be forced to scramble for supplies when they enter the market.

The improvement reported in the Birmingham district a week ago continues. Spot inquiry is better and actual bookings show an increase as more industries are coming into the market for fuel. There also has been a slight gain in the movement through retail channels, but the spot market, particularly on white ash coals, is weak. Most of the current output of those coals is going into the steam trade. The coke market is firm.

Little Consumer Support to Anthracite

Heavy storage buying by local retail distributors is keeping up the flow of anthracite tonnage in the New York



Car Loadings and Supply

	Cars Loaded	
	All Cars	Coal Cars
Week ended Aug. 7, 1926.....	1,083,199	183,088
Week ended July 31, 1926.....	1,102,590	192,609
Week ended Aug. 15, 1925.....	1,064,793	190,979
Week ended Aug. 8, 1925.....	1,051,611	189,761

	Surplus Cars		Car Shortages	
	All Cars	Coal Cars	All Cars	Coal Cars
Aug. 6, 1926.....	179,771	45,836		
July 31, 1926.....	190,073	56,785		
Aug. 7, 1925.....	238,474	72,054		

market. Consumers seem reluctant to add to their supplies. There are many inquiries, but few of these develop into immediate orders. Independent shippers experience difficulty in maintaining their quotations on domestic sizes. Stove still leads in popularity, but egg and chestnut are showing more strength. Pea is steady. No. 1 buckwheat is firmer; demand for rice and barley is only fair.

Philadelphia expects anthracite business to open up on a larger scale with the beginning of next month. Summer buying, it is declared, has been below the seasonal normal. Some increase in consumer orders already has been received by the retailers. Mine offers of blocks of tonnage at cut rates and deferred payment seem to have disappeared. There is considerable speculation as to September prices, with opinion widely divided.

Steam Coals Improve

The Philadelphia steam market has a better undertone. A number of the larger industrial consumers are adding to their stockpiles, although this business has not been sufficient to take up the slack. Nevertheless the amount of coal going into company storage yards is decreasing. The Baltimore retail trade is taking on more life. Consumer buying is spasmodic, but retail ordering is steadily broadening.

Buffalo is taking hard coal much more freely, although the movement is below previous years. Shipments by lake during the week ended Aug. 19 were 94,100 tons. Of this quantity, 52,700 tons were cleared for Superior and Duluth, 14,500 tons for Milwaukee, 7,000 tons for Marquette, 7,000 tons for Green Bay, 6,600 tons for Waukegan and 6,300 tons for Sheboygan.

Flurry in Connellsville Region

Inquiries for contract tonnages of furnace coke aggregating approximately 75,000 tons monthly have thrown the Connellsville region into a state of excitement. Although some business apparently has been closed at less than \$3.25, ovens are now talking a minimum of \$3.50, claiming that any plants called upon to take care of additional tonnage could not operate on a lower basis without loss. Moreover, they argue, present raw coal prices discourage sales of coke at \$3.

Spot furnace quotations have stiffened. Ovens are asking \$3@3.25, against \$2.85@3 a few days ago. Spot foundry coke, however, still remains quotable at \$4@4.50 for standard grades—but with distinct prospects of an advance.

During the week ended Aug. 14, pro-

duction in the Connellsville and Lower Connellsville region was 122,410 tons, according to the *Connellsville Courier*. Furnace-oven output of coke totaled 61,700 tons, an increase of 50 tons over the preceding week. Merchant-oven output was 60,710, an increase of 420 tons.

July Exports Near Record

July exports of bituminous coal from the United States reached the highest figure reported for that month since 1920, when 3,556,802 gross tons were shipped to foreign countries. Last month the total was 3,240,194 tons. During the same month anthracite exports were 389,559 tons and coke, 81,384 tons.

The distribution of the July business is shown in the accompanying table.

To	Anthracite In Tons	Bituminous In Tons	Coke In Tons
Denmark and Faroe Islands.....		126	
France.....		15,512	
Irish Free State.....		50,988	
Gibraltar.....		27,795	
Italy.....		145,272	
Netherlands.....			25
Norway.....		1,200	
Portugal.....		19,574	231
United Kingdom.....		1,520,686	
Canada.....	382,612	1,090,053	70,501
British Honduras.....		3	
Guatemala.....	40	94	
Honduras.....		310	10
Nicaragua.....		800	2
Panama.....		11,004	
Salvador.....		20	
Mexico.....	262	9,521	113
Newfoundland and Labrador.....	14	11,336	
Jamaica.....		20,471	
Other British West Indies.....		4,045	
Cuba.....	6,351	30,113	1,341
Dominican Republic.....		1,226	5
Dutch West Indies.....	55	10,678	10,172
French West Indies.....		12,955	
Virgin Islands of United States.....		6,763	
Argentina.....	10	73,086	
Brasil.....	240	99,264	334
Chile.....			4,503
Colombia.....	23		6
Ecuador.....		2,557	3,557
British Guiana.....		749	
Uruguay.....	2	7,240	4,254
Venezuela.....		10	59
Palestine.....		9,198	
Egypt.....		8,119	
Algeria and Tunis.....		9,960	
Portuguese East Africa.....		23,716	
Canary Islands.....		15,750	
Total.....	389,559	3,240,194	81,384

Nippon Industrial Consumers To Place Big Orders Soon

Tokyo, Japan, July 21.—Comparatively large coal orders are to be placed in coming weeks by Japanese industrial consumers. The state iron works at Yawata is to lay in a store of fuel for the year estimated at between 1,800,000 and 1,900,000 tons. Approximately a million tons will be supplied by the Futase and Shikamachi mines, owned by the government, and the rest will be bought on the open market. Of this latter quantity 300,000 tons has been booked with the Kai Pong, Fushun and Penhsihu mines. Negotiations are in progress with large mine owners in Kyushu for 700,000 tons. The buyers offer 60 or 70 sen less than paid last year, while the sellers quote the previous price, which probably will be more or less reduced.

Chicago Trade Starts Fuel Research Institute To Aid Coal Consumers

Chicago has finally organized a fuel research institute. It is known as the Chicago Fuel Service and Research Institute with headquarters in the Fisher Building. W. L. Bainbridge, combustion engineer, is director.

An organization meeting was held at the Great Northern Hotel last week when the policies of the Institute were made known. It was described as a "service station" for the public in matters of fuel complaints. The service station is comparable to a service station maintained by automobile manufacturers for the servicing of cars purchased by the public. A nominal charge will be made for inspections and regulations and advice in the most efficient and economical operation of furnaces and boilers from both large and small consumers of all kinds of fuel.

The Institute is financed by coal producers and distributors for the public in the city of Chicago and Cook County. The program calls for expansion by easy stages as the Institute grows. In time it is hoped to be able to erect a large building for the Institute's own use.

A corps of inspectors will be employed. New inspectors also will be trained so as to keep pace with the progress of the Institute which is expected to grow rapidly since the demand for the Institute service has already indicated a popularity among the first persons approached for its use.

Outlines Institute Work

Two lines of work on which the Institute is to concentrate its attention and devote its maximum of work were given as follows:

(1). Inspection and conditioning of coal burning equipment in homes, apartment buildings and for consumers in general of this type, in contemplation of making them ready for winter demand and to enable distributors to sell as much storage coal as possible at once.

(2). To confer and advise with fuel consumers who may be contemplating going from coal to oil or vice versa.

Mr. Bainbridge is a graduate of the University of Wisconsin. He completed a course in 1913 in chemical engineering and after graduating became associated with the American Bottle Co., where he was employed as combustion engineer at the Newark, Ohio, plant for six years. He was in the general office as assistant to the vice-president and factories manager, for four years, his duties entailing the purchase of coal, oil and natural gas, totaling approximately 300,000 tons of coal annually. Mr. Bainbridge was born at Mifflin, Wis., in 1888.

Figures from Port Colborne, at the Lake Erie entrance of the Welland Canal, show that shipments of soft coal through that waterway to Lake Ontario ports, mostly to Montreal, in 1925 were 1,952,375 tons. Shipments this season average about 55,000 tons a month.

Foreign Market And Export News

French Collieries Unable to Meet Insistent Fuel Demands

Paris, France, Aug. 4.—Output of the French collieries fall short of coping with the domestic and export demand for coal created by the continued suspension of production at the British pits. Householders here and in the provinces are turning to the French mines for coal to take the place of that normally imported from the United Kingdom. French merchants beseech the collieries for deliveries while the industrialists are bidding up prices in order to accumulate surplus stocks.

There was no new increase in quotations at the French pits the first of the month, but advances are believed to be imminent. Foreign prices, however, have risen sharply. With few exceptions, Dutch operators have added 20@30 fr. to the advances of 80@90 fr. made in July. Russian anthracitic cobbles, which found a cold reception when unloaded at Rouen last fall, are up 90@110 fr. Prices on indemnity fuels have been raised 10@30 fr.

The panicky market is reflected in the increases registered in retail prices in the Paris metropolitan area. Cobbles and nuts for kitchen and grate fires are selling at more than 500 fr., an advance of 89@96 fr. Flaming coals are up 32@42 fr. Belgian anthracitics, selling at 600 fr., show increases of 70@113 fr. Anthracitic mixtures, "British style," have advanced 100@155 fr.; nuts are 720@750 fr.; cobbles, 695@725, and peas, 540@570 fr.

U. S. Exports Heavy

More than 300 ship loads of American coal were sent to Great Britain during May, June and July in consequence of the strike of British coal miners which began in May. Total exports of coal to Great Britain in 1925, were less than 3,000 tons, but in the first month of the strike period the United States shipped more than ten times that quantity to British ports. June shipments advanced to 465,000 tons and the July total reached 1,354,000 tons. As there appears to be no decline as yet in the British demand for American coal it is expected that the August exports will be greater.

Detailed July figures appear on page 303 of this issue.

Trade Quiet in Italian Market

The Italian coal market is inactive on account of exchange uncertainty, according to a report on July 31 by Acting Commercial Attaché A. A. Osborne, Rome. High prices are quoted only in dollars and shillings. Buyers are covering only their immediate requirements although depleted stocks should soon compel replenishment. Genoa stocks are: British, 5,000; American, 11,000;

German, 28,000, including 8,000 state railways stocks, and Russian 4,000 metric tons.

Belgian Producers Boost Prices On Domestic Coals

Brussels, Aug. 5.—Belgian producers, flooded with orders for coal from all quarters, continue to advance prices. This week quotations on domestic unscreened went up 5 fr. and other domestic grades were boosted 5 to 15 fr. Anthracitic beans now command 240 fr. and nuts, 255. Unscreended bituminous is 135@170 fr. and screened semi-bituminous, 205@240 fr. Prices on industrial coals are unchanged.

Official quotations on coals for state consumption are 102@106 fr., depending on the grade and exchange rates. Prices on reparation coals at the Belgian border were increased on Aug. 1. Coking coals of this class are up 5 to 41 fr.; gas coals, 9@45 fr.; semi-bituminous, 4@80 fr., and lean coals, 19@35 fr.

The mines mixed commission has agreed to a 5 per cent advance in wages, effective Aug. 1.

Export Clearances, Week Ended Aug. 19 FOR HAMPTON ROADS

For United Kingdom:	Tons
Br. Str. Ramon de Larrinaga.....	8,781
Br. Str. Helmsdale	5,912
Br. Str. Helmsdale	4,882
Jugo-Slav. Str. Iskra	5,867
Nor. Str. Blenda	2,772
Br. Str. Watsness	4,300
Grk. Str. Fotini Carras	6,603
Br. Str. Peebles	7,660
Grk. Str. Aghios Marcus	6,868
It. Str. Valprato	7,163
Br. Str. Siltonhall	8,982
Br. Str. Woodfield	6,602
Br. Str. Shelly	2,747
Br. Str. Woron	7,490
Br. Str. Copenhagen	6,723
Grk. Str. Chloe	7,315
Br. Str. Gredon	7,245
Sp. Str. Upo Mendi	5,258

For England:	Tons
Nor. Str. Samnanger, for Manchester	6,415
Br. Str. Bridgepool, for Avonmouth.	7,471
It. Str. Valreale, for Tyne River....	7,571

For Scotland:	Tons
Br. Str. Afghanistan, for Glasgow...	7,863
Br. Str. Valdura, for Glasgow	7,771

For Ireland:	Tons
Jugo-Slav. Federiko Glavic, for Queenstown	9,080
Br. Str. Ellerdale, for Dublin.....	5,383

For Italy:	Tons
Am. Str. Blue Triangle, for Genoa...	3,300
It. Str. Tesco, for Palermo.....	7,903
It. Str. Monviso, for Genoa.....	6,355

For Cape Verde Islands:	Tons
Br. Str. Cowdenlaw, for St. Vincent.	7,595

For British West Indies:	Tons
Nor. Str. Edvard Munch, for Barbados	4,079

For Portugal:	Tons
Port. Str. Thome, for Lisbon.....	5,231

For Jamaica:	Tons
Br. Str. Macabi, for Kingston.....	3,313

For Brazil:	Tons
Br. Str. Treverbyn, for Rio de Janeiro	6,420

For Danish West Indies:	Tons
Br. Str. Emperor of Halifax, for Caracao	3,500

For Argentina:	Tons
Br. Str. Tiara, for Rosario	5,551

For Buenos Aires:	Tons
Br. Str. Panama Transport, for Buenos Aires	6,255

For King Howel, for Buenos Aires	Tons
	6,411

FROM BALTIMORE

For Ireland (for orders to England):	Tons
Br. Str. Emlynian	7,516
Br. Str. Hemsloch	6,819
Br. Str. Everilda	4,598
Br. Str. Incemore	5,405
Ital. Str. Valentino Coda	6,741
Br. Str. Grelwen	7,524
Br. Str. Cape Cross	6,077
Gr. Str. George M. Embiricos	9,721
Br. Str. Newaster	4,431
Br. Str. Inkum	7,312
Nor. Str. Hassel	5,664
Ital. Str. San Terenzo	7,427
Nor. Str. Bueland	5,315
Br. Str. Blairmore	4,575
Br. Str. Essex Baron	6,875
Br. Str. Siam City	7,757
Dut. Str. Mirach	5,623
Br. Str. King Bleddyn	9,553
Br. Str. Ingleby	5,425
Br. Str. Wentworth	7,462
Dut. Str. Ootmarsum	5,650
Br. Str. Norman Monarch	7,426
Ital. Str. Hermada	6,537
Br. Str. Anglo-Egyptian	9,477
Br. Str. Ikala	6,256
Br. Str. Tritonia	7,515
Span. Str. Astoi Mendi	6,811
Br. Str. Otterpool	7,981
Br. Str. Nile	8,338

For England:	Tons
Ger. Str. Konsul Carl Fisser, for Birkenhead	7,542
Br. Str. Benmacdhul, for Davenport.	8,241
Ger. Str. Kirsten Miles, for Mersey River	8,437

For Italy:	Tons
Ital. Str. Color, for Leghorn.....	6,296
Ital. Str. Nasco, for Savona	7,804
Ital. Str. Aquitania, for Savona	6,614
Ital. Str. Valflorita, for Palermo....	6,505
Br. Str. Kayak, for Genoa	5,230
Ital. Str. Valperga, for Genoa.....	6,894

For Argentine:	Tons
Br. Str. North Anglia, for Ibiyen....	4,159
Dut. Str. Callisto, for La Plata.....	5,257
Br. Str. Zapala, for Bahai Blauas...	6,831

For Egypt:	Tons
Br. Str. Hampstead, for Alexandria.	4,819
Br. Str. Elswick House, for Alexandria	5,866

For Norway:	Tons
Swd. Str. John Lundwall, for Oslo...	3,050

For Ireland:	Tons
Br. Str. Lamington, for Belfast....	5,535
Br. Str. Heronspool, for Dublin.....	4,616
Span. Str. Margari, for Cork	5,008
Br. Str. Molesey, for Dublin.....	5,477
Br. Str. Amarna, for Dublin	5,401
Br. Str. Pikepool, for Cork.....	5,345

FROM PHILADELPHIA

For Great Britain:	Tons
Br. Str. Baron Inchape, for Queens-town	—
Span. Str. Aritz Mendi, for Liverpool	—

Hampton Roads Coal Dumpings*

In Gross Tons	Aug. 12	Aug. 19
N. & W. Piers, Lamberts Pt.: Tons dumped for week.....	224,011	248,485
Virginian Piers, Sewalls Pt.: Tons dumped for week.....	205,481	190,694
C. & O. Piers, Newport News: Tons dumped for week.....	206,284	219,872

* Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices, Gross Tons

PIERS	Aug. 14	Aug. 21†
Pool 1, New York....	\$5.40@ \$5.65	\$5.35@ \$5.65
Pool 9, New York....	4.85@ 5.10	4.85@ 5.10
Pool 10, New York....	4.60@ 4.85	4.60@ 4.85
Pool 11, New York....	4.35@ 4.50	4.35@ 4.50
Pool 9, Philadelphia..	4.85@ 5.20	4.85@ 5.20
Pool 10, Philadelphia..	4.60@ 4.85	4.60@ 4.85
Pool 11, Philadelphia..	4.30@ 4.55	4.30@ 4.55
Pool 1, Hamp. Roads.	5.00@ 5.15	5.25@ 5.40
Pool 2, Hamp. Roads.	4.85@ 4.90	4.75@ 4.85
Pool 3, Hamp. Roads.	4.25@ 4.35	4.40@ 4.50
Pools 5-6-7, Hamp. Rds.	4.50@ 4.65	4.60@ 4.60

BUNKERS	Aug. 14	Aug. 21†
Pool 1, New York....	\$5.65@ \$5.90	\$5.60@ \$5.90
Pool 9, New York....	5.10@ 5.35	5.10@ 5.35
Pool 10, New York....	4.85@ 5.10	4.85@ 5.10
Pool 11, New York....	4.60@ 4.75	4.60@ 4.75
Pool 9, Philadelphia..	5.10@ 5.35	5.10@ 5.35
Pool 10, Philadelphia..	4.90@ 5.10	4.90@ 5.10
Pool 11, Philadelphia..	4.55@ 4.85	4.55@ 4.85
Pool 1, Hamp. Roads.	5.15	5.40
Pool 2, Hamp. Roads.	4.90	4.75
Pools 5-6-7, Hamp. Rds.	4.65	4.60

† Advances over previous week shown in heavy type; declines in italics.

Coming Meetings

Fifth International First-Aid and Mine-Rescue Contest, San Francisco, Calif., during the first week of September, 1926, under auspices of Bureau of Mines, Department of Commerce.

New York State Coal Merchants Association. United States Hotel, Saratoga Springs, N. Y., Sept. 2-4. Executive secretary, G. W. F. Woodside, Dolan Bldg., Albany, N. Y.

Rocky Mountain Coal Mining Institute. Glenwood Springs, Colo., Sept. 9-11. Secretary, Benedict Shubart, Boston Building, Denver, Colo.

American Institute of Mining and Metallurgical Engineers. Oct. 6-9, at Pittsburgh, Pa. Secretary, H. Foster Bain, 29 West 39th St., New York City.

National Safety Council. Oct. 25-29, at Detroit, Mich. Managing director, W. H. Cameron, 103 East Ohio St., Chicago, Ill.

National Industrial Traffic League. Commodore Hotel, New York City, Nov. 17 and 18. Executive secretary, J. W. Beek, Chicago, Ill.

Coal Mining Institute of America. Annual meeting, Chamber of Commerce, Pittsburgh, Pa., Dec. 8, 9 and 10. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

New Companies

Miller Mines, Inc., 33 West 42d Street, New York City, a New York corporation, has been permitted to own property and transact business in West Virginia, according to a certificate recently filed in the office of the Secretary of State in Charleston. No par-value stock has been issued in the amount of \$90,000 and three mines have been acquired in Preston County, West Virginia. Mines Nos. 1 and 2 are located at Bretz and No. 3 at Kingwood. The stockholders are Alexander Miller, W. V. Kress, E. Salmon, Joseph Miller, president, and Cleveland Miller, secretary, all of 70 W. 40th St., New York.

Pike Fuel Co., Williamson, W. Va., has been chartered at Charleston, W. Va., with a capitalization of \$25,000. The company has its chief works at Pinson Junction, Pike County, Ky., and is organized for the purpose of mining coal, manufacturing coke and developing oil and gas in that section. The incorporators are: W. G. Goodlee, S. H. Goodlee, Jr., Evelyn Nelson, H. A. Nelson and F. F. McElroy, all of Williamson.

The California Coal Co., headed by L. F. Spratler and W. K. Rees, of Los Angeles, Cal., has filed articles of incorporation in the Secretary of State's office. The corporation, capitalized at \$1,000,000, proposes to acquire and operate the Stone Canyon Coal Co. mines, Monterey.

The Maple Leaf Coal Co., Massillon, Ohio, has been incorporated with a capital of \$10,000 to mine and sell coal in the Massillon field. The incorporators are Frank Baer, Jacob Stahldreher, William F. Kutz, J. H. Bottemly and James E. Willison.

New Equipment

New Permissible Explosive Resists Water

Hercogel is a new permissible explosive of the gelatin type manufactured and recently placed on the market by the Hercules Powder Co. The chief advantage of this new explosive is its water-resisting quality.

The Bureau of Mines has issued the following information concerning it: Fume classification, A; class designation, basic characteristic ingredient, 4; to be used with detonators not less efficient than No. 6; weight of 1½x8-in. cartridge, 241 grams (approximately 94 cartridges to a 50-lb. case); smallest permissible diameter, 1½-in.; unit deflagrative charge, 257 grams.

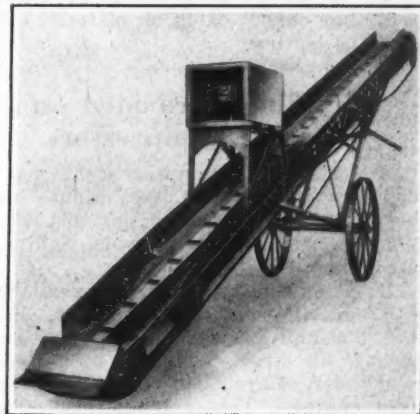
This new explosive is intended for work that is too wet for other types of permissibles. It is not recommended for the general run of coal-mine operations as the ammonium-nitrate permissibles are usually more economical and efficient. This new explosive, however, will prove more satisfactory for work such as the blasting of wet top cut coal than permissibles of the older types.

On a level grade the drive will actuate 250 ft. of conveyor at a capacity of 30 to 40 tons per hour.

Where conditions will permit this drive can be placed under the conveyor as shown in the accompanying illustration. In low coal, however, it can be located beside the shaking trough, in which case the conveyor is actuated by means of a reverse lever.

Conveyor That Does Not Shed Material Over Sides

An improved type of portable belt conveyor, designed for handling sand, gravel, coal, crushed stone and other granular materials or small-piece articles, has recently been placed on the market by the Jeffrey Manufacturing Co., of Columbus, Ohio. The purpose of the improvements is to enable material from hopper-bottom railroad cars to be



Flared Sides Increase Capacity

The sides of the conveyor trough are curved upward and outward, greatly raising the carrying capacity of the belt. The supporting wheels may be moved forward or backward to balance the conveyor.

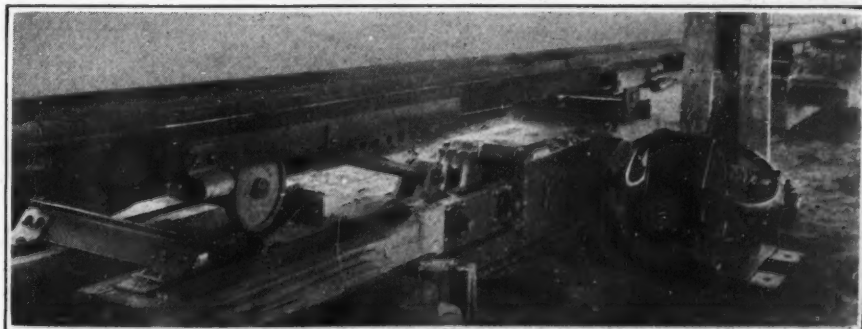
more rapidly handled and to assist in the reclaiming of such materials from piles.

Four important improvements included in the design should be described. (1) Steel side boards bent under the edges of the belt and rising above it on either side form a trough of larger

Drive for Shaking Conveyor Saves Headroom

The Conveyor Sales Co., Inc., 299 Broadway, New York City, is now prepared to furnish a new low drive for Eichhoff shaking conveyors, known as Type MKR. It is totally inclosed, has an overall height of only 19 in. and is intended for use with shaking conveyors of the smallest section. The gears run in oil, and only five external points require lubrication including in this number both bearings and rocker arms. It is driven by a 15-hp. motor, and weighs, exclusive of the motor, 2,100 lb. The latter is connected to the drive proper by means of a pinion and gear.

This new device possesses the same oscillatory characteristics as are incorporated in the larger drive. It will deliver seventy to ninety-five 5½-in. strokes per minute, the number being controlled by a motor-speed regulator.



Drive Can Be Installed Under Shaking Conveyor

This drive is so low that it is usually installed below the trough that it shakes. If headroom is so scant as to forbid this arrangement it may be set to one side and the conveyor driven through a pivoted lever.

capacity than in like conveyors of earlier design. They prevent lumps from rolling off the belt. (2) An improved type of carrying idler furnishes support to the loaded portion of the belt. (3) An extended and flared loading leg is provided at the bottom of the conveyor, edged with belting material to form a seal with the moving belt. This flared hopper also serves to center the load on the conveyor. (4) An efficient gate at the foot of the conveyor prevents material from falling into the inclosed boot housing.

The new conveyor is built in 18-, 24-, or 30-ft. lengths and may be driven either by gasoline engine or electric motor. With a reliable and easily operated screw the elevator is adjusted to any convenient height. Holes in the pipe struts of the frame allow the wheels to be adjusted forward or backward to balance the load. The foot of the conveyor is low so that it will readily penetrate a pile of loose material. The foot pulley is provided also with aligning screws to bring the belt to center. Steel flights are attached to the 16-in. belt to increase the carrying capacity of the machine. They also keep small round particles from rolling down the belt. They are so arranged that they cannot catch on material and tear the belting.

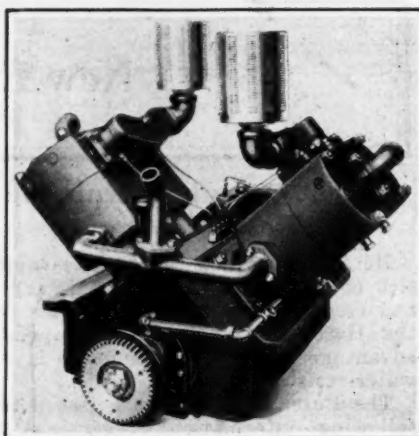
Air Filters Provided on Portable Compressors

A portable air compressor having a capacity of 320 cu.ft. per minute has been added to the line of portable compressors manufactured by the Sullivan Machinery Co., of Chicago.

Units of this type are now available in four different sizes—namely, 110, 170, 220 and 320 cu.ft. per minute capacity, all direct-connected to a Buda 4-cylinder, 4-cycle, tractor-type gasoline engine. This combination, it is stated, has proved unusually smooth running and reliable, as all moving parts of both compressor and engine are carefully balanced to eliminate vibration, and the two units are coupled together to preserve this balance in operation.

The 320-ft. compressor unit is of the V or opposed type, the two pairs of cylinders being set at an angle of 90 deg. with each other, the connecting rods running to a common crankshaft.

Another feature which has been adopted for all these compressors is the



Keeps Grit from Air Cylinders

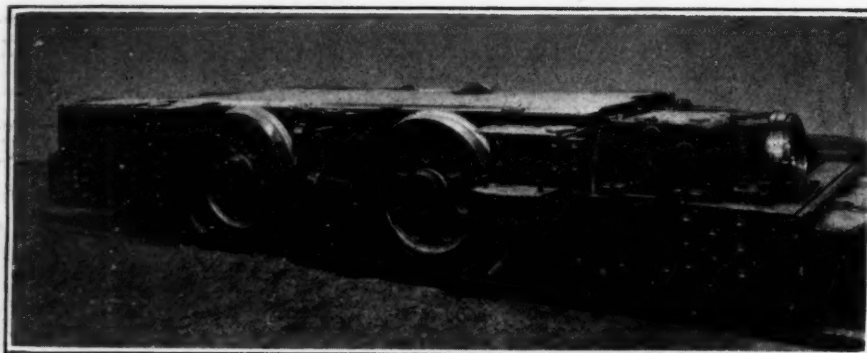
The two devices that look for all the world like dime banks strain out the air and keep the cylinders in good working condition. Where the atmosphere is likely to be dusty some such device is essential; and where around a plant is dust not present?

"Protectomotor" air filter, which is now supplied both on the compressor intake and on the engine intake, thus increasing the life of both compressor and engine by eliminating troubles from the entrance of dirt and grit into the machinery. Both engine and compressor are fully inclosed, splash-lubricated, and water-cooled, a radiator of ample proportion being provided. The compressors are available on steel-wheel mountings or on trailer trucks with spring suspension and rubber tires. The 110-cu.ft. unit may also be mounted on a Ford 1-ton truck. Units of any size are available on skid mountings.

Locomotive Only Four Inches Higher Than the Knees

In many coal mines headroom is at a premium. As thinner and thinner beds are worked the severity of this handicap will probably increase. The accompanying illustration shows a 6-ton gathering locomotive recently developed by the Jeffrey Mfg. Co., of Columbus, Ohio. This machine stands only 25 in. high over all above the rail.

This locomotive is of standard construction except that it is equipped with two 30-hp. motors. This allows of full spring support for the driver axles which is a feature unattainable in the one-motor construction.



Gathering Locomotive of Standard Construction but Low Height

This machine is fitted with two motors and has full spring support over each journal yet stands only slightly over 2 ft. above the rail.

Trade Literature

Regulators for Generator-Voltage Control. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. S.P. 1734. Pp. 55; 8½x10½ in.; illustrated. Covers regulators for direct-current generators, vibrating type regulators for alternating-current generators, application of direct-current generators to exciter service, compensation for voltage drop and parallel operation of regulators, rheostatic-type regulators for alternating-current generators, extended broad-range regulators and special regulator applications.

Flexible Coupling. Poole Engineering & Machine Co., Baltimore, Md. Bulletin 108. Four-page folder describing the principal features, alignment, lubrication and capacity of this coupling.

Inductive Time - Limit Controller. The Cutler-Hammer Mfg. Co., Milwaukee, Wis. Third edition. Publication C-34. Pp. 24; 8½x11 in., illustrated.

Economy of Diesel Engine Power. Fairbanks Morse & Co., Chicago, Ill. Bulletin No. 1010. Pp. 36; 8½x11 in.; illustrated. Gives the analysis of the various factors which affect the cost of power, such as fuel cost, operating labor, maintenance, first cost and fixed charges, reliability and simplicity. The costs of a typical small Diesel power plant are analyzed and compared with similar costs for a steam plant. The cost of purchased power and layout of the Diesel plant also are covered.

De Laval Steam Turbine Co., Trenton, N. J., has issued a 16-page bulletin illustrating and describing the Fairmont Pumping Station at Cleveland.

Ruggles-Coles Dryers. Ruggles-Coles Engineering Division of Hardinge Co., Inc., York, Pa. Catalog 16A. Pp. 32; 8½x11 in.; illustrated. Describes the different classes of dryers, their construction, dimensions, operation, sizes, etc. Dimensions and illustration of the Cyclone Dust Collector for use with dryers are included in this catalog.

Industry's Electrical Progress. The Cutler-Hammer Mfg. Co., Milwaukee, Wis. Publication C-37. Pp. 35; 6x9 in.; illustrated. Tells of the progress made in the development of motor control apparatus.

Crouse-Hinds Co., Syracuse, N. Y., has issued Folder No. 38 illustrating and describing its Safety "Arkite" Plugs and Receptacles, Interlocking Switches and Plugs and Safety Hand Lamps.

Root Spiral Riveted Pipe. Abendroth & Root Mfg. Co., Newburgh, N. Y. Catalog No. 59. Pp. 95; 8½x11 in.; illustrated. Describes how this pipe is made, its various purposes and its unusual length of service. The book also contains information on cast-iron pipe fittings, sheet steel fittings, Root bolted joints and hydraulic giants.

The Kokal Stoker Corp., Wrigley Bldg., Chicago, Ill., has issued a bulletin describing its newest type of coal-burning equipment, the Pulverzone, which combines in one apparatus the three approved methods of burning coal—pulverized coal burning, spread method and coking method.